TABLE 1—APPROVED BUT NOT INCORPORATED BY REFERENCE STATUTES AND REGULATIONS—Continued

State citation	Title/subject	State effective date	EPA approval date	Explanations
173–400–260	Conflict of Interest	3/22/91	6/2/95, 60 FR 28726.	
Olympic Region Clean Air Agency Regulations				
8.1.6	Penalties	5/22/10	10/3/13, 78 FR 61188.	
Spokane Regional Clean Air Agency Regulations				
8.11	Regulatory Actions and Penalties	09/02/14	09/28/15, 80 FR 58217.	
Benton Clean Air Agency Regulations				
2.01	Powers and Duties of the Benton Clean Air Agency (BCAA).	12/11/14	11/17/15 [Insert **Federal Register** citation].	
2.02	Requirements for Board of Directors Members.	12/11/14	11/17/15 [Insert **Federal Register** citation].	Replaces WAC 173–400–220.
2.03	Powers and Duties of the Board of Directors.	12/11/14	11/17/15 [Insert **Federal Register** citation].	
2.04	Powers and Duties of the Control Officer.	12/11/14	11/17/15 [Insert **Federal Register** citation].	
2.05	Severability	12/11/14	11/17/15 [Insert **Federal Register** citation].	
2.06	Confidentiality of Records and Information.	12/11/14	11/17/15] [Insert **Federal Register** citation].	

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[FR Doc. 2015–29180 Filed 11–16–15; 8:45 am]

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FEDERAL COMMUNICATIONS COMMISSION

47 CFR Parts 2, 15, 74, 87, and 90

[GN Docket Nos. 14–166 and 12–268; FCC 15–100]

Promoting Spectrum Access for Wireless Microphone Operations

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: In this document, the Commission takes several steps to accommodate the long-term needs of wireless microphone users. Wireless microphones play an important role in enabling broadcasters and other video programming networks to serve consumers, including as they cover breaking news and live sports events. They enhance event productions in a variety of settings—including theaters and music venues, film studios, conventions, corporate events, houses of worship, and internet webcasts. They also help create high quality content that consumers demand and value. In particular, the Commission provides additional opportunities for wireless microphone operations in the TV bands following the upcoming incentive auction, and provides new opportunities for wireless microphone operations to access spectrum in other frequency bands where they can share use of the bands without harming existing users.

DATES: Effective December 17, 2015, except for the amendments to §§ 15.37(k) and 74.851(l), which contain new or modified information collection requirements that require approval by the OMB under the *Paperwork Reduction Act* (PRA). The Commission will publish a document in the **Federal Register** announcing the effective date of the amendments when OMB approves. The incorporation by reference listed in the rule is approved by the Director of the Federal Register as of December 17, 2015.

FOR FURTHER INFORMATION CONTACT: Paul Murray, Office of Engineering and Technology, (202) 418–0688, email: *Paul.Murray@fcc.gov,* TTY (202) 418–2989.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's *Report and Order* (R&O), FCC 15–100, adopted August 5, 2015, and released August 11, 2015. The full text of this document is available for inspection and copying during normal business hours in the FCC Reference Center (Room CY–A257), 445 12th Street SW., Washington, DC 20554. The full text may also be downloaded at: *www.fcc.gov.* People with Disabilities: To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an email to *fcc504@fcc.gov* or call the Consumer & Governmental Affairs Bureau at 202–418–0530 (voice), 202–418–0432 (tty).

Summary of Report and Order

1. The repurposing of broadcast television band spectrum for wireless services set forth in the *Incentive Auction R&O,* 79 FR 48441, August 15, 2014, will significantly alter the regulatory environment in which wireless microphones operate. Currently, wireless microphone users rely heavily on access to unused channels in the television bands. Following the incentive auction, with the repacking of the television band and the repurposing of current television spectrum for wireless services, there will be fewer frequencies in the UHF band available for use for wireless microphone operations. The Commission took several steps in the *Incentive Auction R&O* to accommodate wireless microphone operations—including providing more opportunities to access spectrum on the channels that will remain allocated for television post-auction and making the 600 MHz Band guard bands available for wireless microphone operations—while also recognizing that the reduction of total available UHF band spectrum will require many wireless microphone users to make adjustments over the next few years regarding the spectrum that they access and the equipment they use. To facilitate wireless microphone users' ability to make these adjustments, the Commission provided that users could

continue to access spectrum repurposed for wireless services during the post-auction transition period, under specified conditions, as they transition affected services to alternative spectrum.

2. This proceeding was initiated to explore steps to address wireless microphone users' longer term needs. The actions the Commission is taking in this R&O make additional spectrum resources available to accommodate wireless microphones users' needs over the long term. The Commission's goal is to enable the development of a suite of devices that operate in different bands and can meet wireless microphone users' various needs while efficiently sharing the spectrum with other users.

I. Background

3. In this proceeding the Commission uses the term ''wireless microphones'' to reference wireless microphones and other related wireless audio devices. The Commission has authorized wireless microphone operations in different spectrum bands to accommodate the growing use of these devices by different users. The technical and operational rules for wireless microphone operations in these different bands have varied, depending on the band, and generally are designed to enable wireless microphone users to operate in shared bands along with other users.

A. Wireless Microphone Operations

4. Under current rules, the Commission has authorized wireless microphones to operate both on a licensed basis, limited to specified users, and on an unlicensed basis. The table below sets forth the bands in which wireless microphones and related audio devices generally operate today pursuant to the Commission's rules.

Frequency band	Licensed/unlicensed	Rule part
26.1–26.48 MHz (VHF)	Licensed	Part 74.
161.625–161.775 MHz (VHF)	Licensed	Part 74.
Portions of 169–172 MHz band (VHF)	Licensed	Part 90.
88–108 MHz (FM)	Unlicensed	Part 15.
450–451, 455–456 MHz (UHF)	Licensed	Part 74.
54–72, 76–88, 174–216, 470–608, 614–698 MHz (VHF and UHF)	Licensed and unlicensed	Part 74 and Part 15 (waiver).
944–952 MHz (UHF)	Licensed	Part 74.
902–928 MHz, 2.4 GHz, 5 GHz (ISM bands)	Unlicensed	Part 15.
1920–1930 MHz (unlicensed PCS)	Unlicensed	Part 15.
Ultra-wideband (3.1–10.6 GHz)	Unlicensed	Part 15.

5. *Recent actions affecting operations in the TV bands.* Most wireless microphones users today operate their devices on a secondary basis in the TV bands, with most operations occurring in the UHF TV bands. Recent actions taken by the Commission in three proceedings affecting the TV bands spectrum—which have involved the repurposing of UHF TV band spectrum for wireless services in the 700 MHz band (channels 52–69, the 698–806 MHz band), the development of rules for TV white space devices in the TV bands, and the repurposing of the 600 MHz Band following the upcoming incentive auction—have affected and will affect the future availability of spectrum for wireless microphone users and uses in these bands. These proceedings inform the instant proceeding, providing the backdrop for many of the issues the Commission is addressing in its efforts here to accommodate wireless microphone users and uses both in the near and longer term.

6. In the *Incentive Auction R&O* (GN Docket No. 12–268) adopted in May 2014, the Commission adopted rules to implement the broadcast television spectrum incentive auction, which will involve reorganizing the existing television band and repurposing a portion of the UHF television band for new wireless broadband services, and which will affect wireless microphone operations across the current TV bands. As part of its decision, the Commission took several actions to accommodate wireless microphone operations, including making rule revisions to provide additional opportunities for wireless microphone operations in the bands that will remain allocated for television following the incentive auction, permitting wireless microphone operations in the newly-designated 600 MHz Band guard bands, and providing for a transition period to give wireless microphone users that will need to cease operating in the spectrum repurposed for 600 MHz Band wireless services sufficient time to replace their equipment and move operations to other spectrum bands available for wireless microphone uses.

7. Finally, concurrent with adoption of the *Incentive Auction R&O,* the Commission adopted the *TV Bands Wireless Microphones Second R&O,* 79 FR 40680, July 14, 2014, (part of WT Dockets 08–166 and 08–167, ET Docket No. 10–24) to broaden the eligibility for wireless microphone operations in the TV bands to include entities that regularly utilize a substantial number of wireless microphones for large events and productions and which have the same needs for interference protection as existing low power auxiliary station (LPAS) licensees. Specifically, the Commission expanded part 74 LPAS eligibility to include qualifying professional sound companies and operators of large venues that routinely use 50 or more wireless microphones.

B. Wireless Microphones NPRM

8. In the Notice of Proposed Rulemaking (*NPRM*), 79 FR 69387, November 21, 2014 in this proceeding, the Commission examined wireless microphone users' needs and technologies that can address them, and sought broad comment on a variety of existing and new spectrum bands that might accommodate those needs in the future. It presented an overview of current wireless microphone operations, and observed that most wireless microphone operations today occurred in the TV bands. It also generally discussed wireless microphone operations in other bands, both on a licensed and an unlicensed basis. It discussed the many different types of users and uses (*e.g.,* broadcasters, major sports leagues and theater/entertainment venues, houses of worship, conference centers, corporations, schools, etc.), different types of wireless microphones serving specific needs and applications (from extremely sophisticated, high fidelity microphones used in a professional setting, to microphones that do not require the same level of audio quality or performance to meet particular needs), and varying operational environments (both outdoor and indoor). It also noted that there had been many technological advances in

recent years, and that many operations were being migrated to bands outside of the TV bands, including in bands available for unlicensed operations. Given that wireless microphones serve the needs of diverse users for different types of applications, and make use of several different frequency bands, it sought to develop a full record and framework for how best to accommodate these needs in the near and over the long term. In response to the *NPRM,* the Commission received nearly 90 comments and 17 reply comments.

II. Discussion

9. In this Order, the Commission takes several actions to accommodate wireless microphone users' needs in the coming years. Many types of users employ wireless microphones in a variety of settings. Wireless microphone operations range from professional uses, with the need for numerous high-performance microphones along with other microphones, to an individual consumer's use of a handheld microphone at a conference or in a karaoke bar. Through these actions, the Commission seeks to enable wireless microphone users to have access to a suite of devices that operate effectively and efficiently in different spectrum bands and can address their respective needs.

10. As discussed below, the Commission adopts several changes in its rules for operations in the TV bands, where most wireless microphone operations occur today. With respect to the TV bands, the Commission revises its rules to provide more opportunities to access spectrum by allowing greater use of the VHF channels and more co-channel operations without the need for coordination where use would not cause harmful interference to TV service. It also expands eligibility for the licensed use of the duplex gap to all entities now eligible to hold LPAS licenses for using TV band spectrum. The Commission also will require new wireless microphones operating in the TV bands and certain other bands to meet the more efficient analog and digital European Telecommunications Standards Institute (ETSI) standards, which will ensure more efficient use of the spectrum. In addition, the Commission addresses consumer education and outreach efforts that can help consumers transition out of the TV band spectrum that is repurposed for wireless services, and equipment certification procedures that will apply to wireless microphones in the future. The Commission also takes several additional actions with respect to other spectrum bands currently available for wireless microphone operations to enable greater use of these bands to accommodate wireless microphone uses in the future. Specifically, it adopts revisions to provide new opportunities for such use in the 169–172 MHz band and the 944–952 MHz band. Finally, the Commission opens up portions of three other sets of spectrum bands—the 941–944 MHz and 952–960 MHz bands (on each side of the 944–952 MHz band), the 1435–1525 MHz band, and the 6875–7125 MHz band—for sharing with licensed wireless microphone operations under specified conditions.

A. Promoting Technological Advances

11. In the *NPRM,* the Commission inquired about advances in the state of analog and digital wireless microphone technologies and the extent to which these technologies could be made more efficient for different types of operations, thereby increasing the number of microphones that could access a given amount of spectrum. In particular, the Commission asked whether it should adopt more spectrally efficient analog and digital emission masks for operations in certain bands. It also sought comment on other technological advances that could promote more opportunities for accommodating wireless microphone operations in different bands over the long term—including development of equipment with replaceable components, expanding the tunability of equipment within bands, the development of multi-band equipment, the use of databases, or the use of electronic keys or similar mechanisms.

12. Wireless microphone manufacturers assert that significant steps have already been taken to make for more efficient use of available spectrum, including the increasing use of newer digital technologies that can greatly expand the number of microphones on a TV channel for many types of applications that do not require the highest sound fidelity. Several also state that more devices are increasingly being designed for operations in bands outside of the TV bands, including in bands permitting unlicensed operations, and that these new devices can efficiently and effectively accommodate many wireless microphone users' needs. Wireless microphone manufacturers generally asserted that adopting rules that require specific features (*e.g.,* modular components, use of multi-band equipment, requirement for database connectivity, or use of electronic keys) are unnecessary and could impair design features and add costs and complexities.

13. While many wireless microphone manufacturers explain that they are already committed to harnessing technological advances in this area, the Commission reiterates the importance of improved spectral efficiency, spectrum sharing, and flexibility. It expects wireless microphone manufacturers to continue to take advantage of technological advances to promote more efficient use of spectrum available for wireless microphone operations. To further promote efficient use, the Commission also is taking the step of adopting the more efficient ETSI standards for wireless microphones in several bands, as discussed below. The Commission also anticipates that future technological advances will enable wireless microphones to more effectively share the available spectrum resource, and require use of certain technological advances to protect incumbent operation when authorizing wireless microphone users to access the 1435–1525 MHz band spectrum in the future.

B. Operations in Specific Bands

14. In the sections below, the Commission addresses the actions that it is taking in this R&O with respect to wireless microphone operations in different spectrum bands. The Commission discusses each of the bands on which it sought comment in the *NPRM,* and its decisions regarding these bands and any revisions that it is adopting.

1. VHF/UHF Television Bands

a. Background

15. The Commission's current part 74, subpart H rules authorize operations of wireless microphones and other LPAS on a licensed basis in the bands allocated for TV broadcasting (Channels 2–51, except channel 37). These LPAS devices are intended to transmit over distances of approximately 100 meters. In addition to wireless microphones, these LPAS devices include such uses as cue and control communications and synchronization of TV camera signals. The Commission's rules permit licensed LPAS operations on a secondary, non-exclusive basis. Entities eligible to hold these LPAS licenses include broadcasters, television producers, cable producers, motion picture producers, and qualifying professional sound companies and operators of large venues. Since 2010, the Commission also has permitted unlicensed operations of wireless microphones in the core television bands (channels 2–51, except channel 37) pursuant to a limited waiver and certain part 15 rules

until such time as final rules for unlicensed operations under part 15 are adopted.

16. Under the part 74 LPAS rules, licensed wireless microphones are permitted to operate with a maximum bandwidth of 200 kHz (made up of one or more 25 kHz segments). In the VHF band (channels 2–13, which include the 54–72 MHz, 76–88 MHz, and 174–216 MHz frequencies) power levels are limited to 50 mW, whereas in the UHF band (channels 14–51, except channel 37, which include the 470–608 MHz and 614–698 MHz frequencies), power levels can range up to 250 mW. The power levels for unlicensed wireless microphone operations pursuant to waiver, however, are limited to no more than 50 mW throughout the TV bands (both VHF and UHF). Licensed and unlicensed wireless microphones may operate co-channel with television stations at locations that are separated from television stations by at least 4 kilometers from their protected contours. In addition, licensed LPAS users may operate on a co-channel basis even closer to television stations provided that such operations have been coordinated with affected broadcasters.

17. The particular television channels available for wireless microphone operations will vary depending on the specific location. In many instances these channels also are available for use by unlicensed white space devices. The Commission currently designates the two unused television channels (where available) nearest channel 37 (above and below) for wireless microphone uses, prohibiting white space devices on those channels. As discussed in the *Incentive Auction R&O,* following the incentive auction, these two channels will no longer be designated exclusively for wireless microphones following the repacking of the TV bands. On channels where both wireless microphones and white space devices may operate, licensed LPAS operators—including the newly eligible professional sound companies and venue licensees—will be able to register to obtain protection from interference from white space devices by reserving channel(s), on an as-needed basis, at specified locations and times of operation in the broadcast TV bands databases. In addition, under existing rules certain qualifying unlicensed wireless microphone operators can obtain interference protection from unlicensed white space devices at specified times by registering with the Commission, enabling them to have their operations included within the broadcast TV bands databases. The Commission also indicated that it would be taking steps in the Part 15 proceeding to make improvements to the registration system in the TV bands databases to enable more timely and effective reservation of channels that would be protected from unlicensed white space device operations.

18. As set forth in the *Incentive Auction R&O,* the current VHF/UHF television bands (channels 2–51, except channel 37) will be reorganized following the upcoming incentive auction. As a result of this auction, the amount of spectrum allocated for television services will be reduced and repacked, some of the current TV bands spectrum will be designated for 600 MHz Band guard bands (including the duplex gap), and other TV bands spectrum will be repurposed for 600 MHz Band wireless services. As discussed below, these revisions will affect wireless microphone operations, which currently operate throughout in existing TV bands, in several ways. In the *NPRM,* the Commission sought comment on wireless microphone operations with respect to each of these bands—the TV bands, the 600 MHz Band guard bands, and the 600 MHz Band being repurposed for wireless services.

b. Discussion

19. In this section, the Commission sets forth part 74 rule revisions to accommodate licensed wireless microphone (and other LPAS) operations in the VHF and UHF spectrum in the repacked TV bands that will continue to be available for TV broadcast services following the incentive auction. The Commission is not addressing in this proceeding certain issues relating to wireless microphone operations in the TV bands and in the repurposed 600 MHz Band since these matters are being addressed instead in the part 15 proceeding. In particular, it does not here address the rules for unlicensed wireless microphone operations in the TV bands and the repurposed 600 MHz Band, which are addressed as part of the *Part 15 Report and Order (FCC 15–99, ET Docket No. 14–165, adopted August 6, 2015 and released August 11, 2015).* Similarly, it does not address in this proceeding the technical rules for operations of unlicensed wireless microphones in the guard bands, including the duplex gap. Nor does it address here the technical rules for licensed wireless microphone operations in the duplex gap, since the technical issues relating to their operations are intertwined with the technical issues concerning unlicensed operations in the duplex gap and protection of licensed operations outside of the duplex gap. Finally, the Commission addresses revisions pertaining to the white spaces databases in the *Part 15 Report and Order.*

(i) TV Bands

(a) VHF Band Revisions

20. Under the existing technical rules for LPAS operations under part 74, licensed wireless microphone users that operate on a secondary basis in the VHF band (channels 2–13) operate generally under the same technical rules as for operations in the UHF bands. However, with respect to power levels, VHF band operations are restricted to no more than 50 mW, well below the 250 mW levels permitted for operations in the UHF bands.

21. In the *NPRM,* the Commission sought comment on the potential for expanding use of VHF television channel spectrum for wireless microphone operations. In particular, it asked whether it should revise the power limits for LPAS operations in the VHF band to conform to those applicable for LPAS devices in the UHF television band. The Commission asked whether allowing higher power limits would raise concerns regarding potential interference to TV stations operating in the VHF bands or the wireless video assist devices that operate in the upper VHF band. It also sought comment on the minimum co-channel separation distance, and whether that distance would need to be increased. In addition, it invited comment on other rule revisions that would facilitate more use of this spectrum.

22. The Commission is revising its rules to provide more opportunities for licensed wireless microphone use of these VHF channels. While the Commission is not permitting power levels of up to 250 mW conducted power, it is revising the rules that currently measure the 50 mW limit in terms of conducted power, to specify the 50 mW limit in terms of effective or equivalent isotropically radiated power (EIRP), as suggested by Shure in its comments. Several reasons inform this approach. As noted by Shure, specifying the power levels in terms of EIRP instead of conducted power will be particularly beneficial to wireless microphone users in the VHF band, where the efficiency of antennas is lower due to the longer radio wavelengths. This approach will allow manufacturers to adjust the conducted power output of a device to compensate for low antenna efficiency, thus helping address wireless microphone operators' interest in making greater use of this

spectrum without the need for a larger antenna. By revising the rules to specify the current 50 mW power limits in terms of EIRP, the Commission addresses the Consumer Electronic Association's concerns that wireless microphone operations do not increase the potential for interference to TV broadcasts. This revision represents a balance in addressing the concerns raised, and will increase the performance and usability of wireless microphones operating on this VHF spectrum without significantly increasing the risk of interference to TV. Specifying the power limit in terms of EIRP also ensures uniformity in the maximum radiated power for wireless microphone operations (licensed and unlicensed) in the VHF band. The change the Commission is making does not necessitate any increase in the four kilometer separation distance between wireless microphones and co-channel TV contours since the Commission is not allowing any higher EIRP than it assumed in establishing this distance. The Commission will accept applications to certify LPAS devices under this rule as soon as that rule becomes effective, and it will require applications to certify under this revised rule nine months following release of the Commission's (*Forthcoming Channel Reassignment PN)* to conform the date with related certification requirements the Commission is adopting.

(b) Licensed Co-Channel Operations Closer Than Specified Separation Distances

23. In the *Incentive Auction R&O,* the Commission permitted licensed wireless microphone users to operate closer to television stations than permitted under the revised separation distances (*i.e.,* no closer than 4 kilometers from the outside of the digital television contours) provided that they coordinated their operations with affected broadcasters. The Commission noted, however, that several commenters had proposed to permit wireless microphone operations on a co-channel basis without requiring coordination, such as in locations where the TV signal falls below specified threshold, where the microphones are shielded from the TV signals due to building attenuation, or where no over-the-air television receivers are in operation.

24. In the *NPRM,* the Commission sought to develop a more extensive record on whether to permit licensed wireless microphone operations on a co-channel basis closer than the generally applicable separation distances set forth in its rules, without the need for coordination, noting its goal to provide more opportunities for licensed wireless microphone operations in the spectrum that will continue to be allocated for television services to the extent such operations would not cause harmful interference to TV operations. In particular, the Commission proposed to allow LPAS licensees to operate co-channel with television closer to the television station than provided by the separation distance rules in locations in which the co-channel TV signal is below a specified threshold. It sought comment on the suitable TV signal threshold, and whether other safeguards would ensure that licensed wireless microphone operators do not otherwise cause harmful interference to TV reception. It limited this proposal to licensed wireless microphone users, whom the Commission would expect to have the requisite wireless microphone systems, as well as technical and operational abilities, to be able to determine the level of the co-channel TV signals at a given location, and thus would be able to comply with such a threshold. The Commission also asked whether it should require licensed wireless microphone users to register their co-channel operations in the TV bands databases to provide information to any television licensee concerned about possible harmful interference. As an alternative, it sought comment on whether to permit co-channel licensed wireless microphone operations in indoor venues, such as in theaters or music auditoriums. It also invited comment on other approaches.

25. The Commission will permit closer co-channel operations by licensed wireless microphone operators on any TV channel where the TV signal falls below a threshold of –84 dBm over the entire TV channel, provided certain conditions are met. Such operations will be limited to systems operating at an indoor location, and not in an itinerant fashion where the signal threshold could be ever-changing, and the location is not being used for over-the-air television viewing. The Commission also requires that the licensed operators have the requisite wireless microphone systems for determining the threshold at the location, as well as the professional qualifications for evaluating the signals, and that the signals be measured where the wireless microphones would be operated at the location, and must be scanned across the full six-megahertz TV channel; to the extent directional antennas are employed, they must be rotated to the place of the maximum signal at the location. The Commission believes this approach for licensed wireless microphone operations is reasonable for several reasons. As Sennheiser points out in its comments, the signals would exceed the threshold of visibility under the Advanced Television Systems Committee guidelines. The location of operations is indoors and contained, and wireless microphone signals do not generally transmit beyond very limited distances (*e.g.,* generally ranging between 100–300 feet) at low levels. In addition, the Commission expects that there would be significant attenuation of the wireless microphone signal, both around the microphone (*e.g.,* loss because it is hand-held, or because of body loss) and as a result of building and other attenuation, thus further reducing the likelihood of harming TV viewers outside of the location.

(c) Adoption of ETSI Emission Mask Standards for Analog and Digital Wireless Microphones

26. The technical rules applicable to part 74 LPAS devices operations in the TV bands set forth specified out-of-band emission mask requirements for wireless microphones, regardless of whether the device is analog or digital. These rules have not been revised since 1987.

27. In the *NPRM,* the Commission proposed revising the emission masks applicable to wireless microphones and LPAS devices, with respect to both analog and digital wireless microphones, to comply with the applicable ETSI standards for analog and digital wireless microphones that operate over 200 kHz channels. Specifically, it proposed to require that emissions from analog and digital unlicensed wireless microphones comply with the emission masks in Section 8.3 of ETSI EN 300 422–1, *Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement.* Because the ETSI emission masks are defined only over a frequency range of plus or minus one megahertz from the wireless microphone carrier frequency, the Commission sought comment on the emission limits that should apply outside of this frequency range. In addition to the ETSI standards, or as an alternative, it inquired whether there are other technical standards that it should adopt to promote more efficient use of the spectrum available for wireless microphone operations in the TV bands. Finally, it asked that, if it were to decide to adopt revised standards, how quickly

it should require new devices to comply with the new standards.

28. To promote more efficient use of the limited TV band spectrum available for wireless microphones, the Commission is adopting the ETSI standard emission masks for LPAS devices used by wireless microphone licensees under its part 74 rules. Specifically, it will require that emissions from analog and digital unlicensed wireless microphones comply with the emission masks in Section 8.3 of ETSI EN 300 422–1 v1.4.2 (2011–08), *Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement.* Requiring wireless microphones to meet these tighter emission requirements will protect authorized services in adjacent bands from harmful interference, and will improve spectrum sharing by wireless microphones. Outside of the frequency range where the ETSI masks are defined (one megahertz above and below the wireless microphone carrier frequency), the Commission will require that emissions comply with same limit as the edge of the ETSI masks, specifically, 90 dB below the level of the unmodulated carrier. The Commission is incorporating the emission mask requirements set forth in ETSI EN 300 422–1 v1.4.2 (2011–08) into the Part 74 Subpart H LPAS rules by reference and adding it to the list of measurement procedures in section 74.861. The Commission is not persuaded by Lectrosonics' comments that existence of its legacy unlicensed wireless microphones that would not be compliant with the new standard should prevent the Commission from establishing a more efficient standard for wireless microphone devices going forward. The Commission will require the LPAS devices to comply with this standard no later than nine months following release of the *Channel Reassignment PN.*

(d) Other TV Bands Revisions

29. In the *NPRM,* the Commission also sought comment generally on whether it should adopt any other rule revisions for operations of wireless microphones in the TV bands spectrum that would facilitate more effective and efficient operations in these bands. It asked that commenters provide detailed information on reasons for the proposed changes as well as the types of specific rules that they advocate.

30. The Commission concludes that extending the existing waiver of its rules to permit nuclear power plants the continued use of spectrum in the core TV bands would serve the public interest. Consequently, the Commission hereby grants a permanent waiver of its rules to allow the continued use of wireless headsets at nuclear power plants, under the same conditions as the current waiver, in the spectrum that will continue to be allocated for television following the incentive auction. In addition, this waiver will permit nuclear power plants to continue to access the spectrum repurposed for 600 MHz wireless service during the transition period, but no later, provided that they meet the conditions for secondary operations in this band. The terms of this waiver do not extend to include operations in the 600 MHz guard bands, including the duplex gap, which will no longer be allocated for broadcast TV. As discussed in the *Part 15 Report and Order,* wireless microphone operations in these bands will be limited to 20 mW EIRP, which is more restrictive than allowed for wireless microphones in the TV bands. Further, the Commission is not granting, under the terms of this waiver, any right to continue to operate in the 600 MHz Band after the end of the post-auction transition period. Unlike the waiver the Commission is granting, nothing in the record before it indicates whether the 600 MHz wireless licensees might agree to the request of the Nuclear Energy Institute and the United Telecom Council relating to this issue, so the Commission declines to grant their additional request at this time.

31. In granting this permanent waiver, the Commission declines to revise the part 74 LPAS rules to provide for such operations on a licensed basis. The Commission previously declined to make nuclear plants eligible under part 74, and the issues raised regarding the use of these particular devices involve considerations unique to the nuclear power industry, and do not apply to other part 74 LPAS licensees. Further, in light of the Commission's grant of a permanent waiver with the associated conditions, licensee status is not necessary.

c. Eligibility for Licensed Operations in the Duplex Gap

32. In the *Incentive Auction R&O,* the Commission provided that broadcasters and cable programming networks using wireless microphones on a licensed basis would be able to obtain interference protection from unlicensed devices in a portion of the duplex gap at specified times and locations, on an as-needed basis. In the *NPRM,* the Commission sought comment on whether it should expand eligibility for licensed wireless microphone operations in the duplex gap to include all of the entities now eligible for Part 74 LPAS licenses in the TV bands. In particular, the Commission asked whether such expanded eligibility would create problems for broadcasters or cable programming networks operating on this spectrum, or whether these different users generally operate at different locations, such that their respective operations would not likely interfere with each other.

33. As discussed in the *Incentive Auction R&O,* the Commission provided that broadcasters and cable programming networks using wireless microphones on a licensed basis could operate in a portion of the duplex gap, where they would be protected from interference by unlicensed devices in order to have access to spectrum for certain programming, including emergency information. The Commission concludes that expanding eligibility to the other licensed part 74 entities should not cause any problems for broadcasters and cable programming networks since the licensed entities will be obligated to coordinate their operations when and where necessary. The Commission notes that, as a general matter, these different licensees will likely operate at different locations and not interfere with each other.

d. Transition Out of the 600 MHz Band Repurposed for Wireless Services

(i) Background

34. Following the upcoming incentive auction, certain existing television channels in the UHF band will be repurposed for 600 MHz Band wireless services. In the *Incentive Auction R&O* the Commission provided for a multi-year period to help smooth the transition as wireless microphone operators take steps to obtain new equipment and transition out of the use of this spectrum no later than the end of post-auction transition period (*i.e.,* 39 months after the issuance of the *Channel Reassignment PN*). Specifically, following the auction these operators may continue to access the 600 MHz Band during the transition period, but no later, subject to certain conditions. To the extent that either licensed or unlicensed wireless microphone users operate in the 600 MHz Band during this transition period, then consistent with their secondary or unlicensed status they will not be entitled to any interference protection from operations of the primary 600 MHz licensees, and they will be required to cease any operations in the 600 MHz Band if their operations cause harmful

interference to any 600 MHz licensee's operations.

35. In the *NPRM,* the Commission sought comment on how best to facilitate a smooth transition as wireless microphone and other LPAS users cease their operations on the repurposed 600 MHz Band frequencies no later than the end of the post-auction transition period. The Commission indicated that achieving a smooth transition will involve actions by it, by manufacturers and distributors of wireless microphones, and by the various wireless microphone operators themselves, both licensed and unlicensed users. Even though the specific UHF band frequencies repurposed for 600 MHz Band wireless services will not be known until following the auction, beginning preparation for transition as soon as possible will contribute to a smoother transition. The Commission observed that some wireless microphones are likely to be capable of operating on repurposed channels, while others will not. The Commission also pointed out that although the specific frequencies on which particular wireless microphones operate may be identified in the owner's manual, the channels often are not evident on the devices themselves.

(ii) Discussion

(a) Consumer Education and Outreach; Disclosure Requirements

36. The Commission specifically sought comment in the *NPRM* on how best to inform users of wireless microphones on the changes following the auction that will affect their use of wireless microphones in the TV band spectrum that is being repurposed, including the steps necessary to prevent interference to new wireless operations in the 600 MHz spectrum, consistent with its goals expressed in the *Incentive Auction R&O.* The Commission anticipated a need for education and outreach directed at wireless microphone users, and that this should commence before the auction and continue even beyond the end of the 39-month transition period. The Commission proposed that these education and outreach efforts should be undertaken by it, manufacturers, wireless microphone users groups, and relevant trade publications and other possible sources of information for wireless microphone users. As a companion to these efforts, the Commission also proposed requiring that written disclosures accompany new devices at the point of sale to provide further education to wireless microphone users on the devices' operations. In considering these actions, the Commission drew extensively from the approach that it took with respect to the transition of wireless microphones out of the 700 MHz band. Its goals were to make information available so users, particularly unlicensed users, are aware that they must not cause harmful interference to new wireless operations in the 600 MHz band, and must cease operating their wireless microphones on the repurposed 600 MHz Band allocated for 600 MHz Band wireless services no later than the end of the transition period (*i.e.,* 39 months after the release of the *Channel Reassignment PN*); to set in motion a process so they are aware of relevant factors concerning the operation of wireless microphones that are currently in use; and to establish a means for users to locate additional spectrum and equipment for their operations that will be available for their use. The Commission believed that a successful consumer education and outreach campaign would involve its staff working with a broad group of interested entities, including wireless microphone manufacturers, wireless microphones users, and user representatives.

37. The Commission sought comment on the particular actions that wireless microphone manufacturers, distributors, retailers, and other entities comprising the wireless microphone community should take to inform the wide range of wireless microphone users about the ongoing developments concerning wireless microphone use—particularly the need to vacate the repurposed 600 MHz Band, the timetable for doing so, and the conditions for operating in the band during the transition period. It asked what specific information should be provided to wireless microphone users to ensure that they know the requirements for operating in the repurposed spectrum during the transition period and the need to exit the band by the end of the transition, as well as what steps can be taken to provide wireless microphone users with information on the transition prior to the auction. In particular, the Commission inquired whether it would it be beneficial for wireless microphone users to have access to a database or some form of online mapping tool to help users that enter the location and operating frequencies to determine whether they can continue to operate in the repurposed 600 MHz Band during the transition period, and if so, who should be responsible for developing and maintaining (hosting) it. Similarly, the Commission asked whether it should work with wireless microphone manufacturers to obtain information on models of wireless microphones that it could list on its Web site in order to facilitate a smooth transition from the 600 MHz Band. In addition to steps that may involve manufacturers, the Commission sought comment on what steps other parties associated with the sale and operation of wireless microphones (*e.g.,* trade associations, user groups, or industry associations), may be able to take to provide users with information relevant to the transition.

38. The Commission also invited specific comment on what additional information it should make available for wireless microphone users, including Commission-issued consumer ''fact sheets'' and ''frequently asked questions'' (FAQ's) which would address, among other matters, information on operation in the 600 MHz Band, the reason for the need to operate on frequencies outside of that band following the transition, the availability of other frequency bands for wireless microphone use, and the need to comply with Commission rules.

39. Finally, the Commission proposed to revise its point-of-sale disclosure requirement that it adopted in the *TV Bands Wireless Microphones R&O,* 75 FR 9113, March 1, 2010, in order to provide information to wireless microphone users that may have to purchase or lease new equipment so that they can vacate the repurposed 600 MHz Band. Specifically, with regard to sales of wireless microphones that are capable of operating in repurposed spectrum, the Commission proposed to require that such sales include point-of-sale disclosures that inform buyers that they are buying a microphone that cannot be used in certain frequencies following the transition. The Commission also sought comment on how point-of-sale disclosures could be designed to effectively address any ban on manufacturing and marketing of wireless microphones that are capable of operating in the repurposed 600 MHz Band. It also proposed that the revised point-of-sale disclosures direct buyers to the manufacturer's toll free telephone number or the manufacturer's Web site where the buyer can obtain more detailed information on the extent to which the microphone may be affected by repurposing the 600 MHz Band, and asked whether it should retain the existing language in the point-of-sale disclosure requirement that includes the Commission's toll free number and the Commission's Web site where users can obtain additional information on the operation of wireless microphones during the transition period and after

the transition period. The Commission proposed that the effective date for any disclosure requirement, including a point-of-sale requirement, which it may adopt in connection with this or a related proceeding, would be 18 months after the release of the *Channel Reassignment PN,* and sought comment on possible alternative dates as well. It requested comment on the particular factors that should enter into this determination.

40. As set forth in the *NPRM,* consumer education regarding the operations of wireless microphones following the incentive auction is important. Consumers will need to be informed of the many changes that will affect their use of the current TV bands that is being repurposed, including their use of the 600 MHz guard bands and duplex gap, their continued use of repurposed 600 MHz Band during the post-auction transition period (*i.e.,* the 39 months following issuance of the *Channel Reassignment PN*), and their need to cease operations in the 600 MHz Band no later than the end of the post-auction transition period. The steps required are similar to those taken in 2010 to inform consumers about their use of the TV bands that were repurposed for 700 MHz Band wireless services.

41. *Disclosure Requirement.* The Commission requires anyone selling, leasing, or offering for sale or lease wireless microphones that operate in the 600 MHz Band to provide certain disclosures to consumers, pursuant to section 302. These entities must display the Consumer Disclosure, the text of which will be developed by Commission staff, at the point of sale or lease, in a clear, conspicuous, and readily legible manner. In addition, the Consumer Disclosure must be displayed on the Web site of the manufacturer (even in the event the manufacturer does not sell wireless microphones directly to the public) and of dealers, distributors, retailers, and anyone else selling or leasing the devices. The Commission finds that these disclosures are necessary to ensure that consumers are informed that the wireless microphones may be used, under specified conditions, no longer than the post-auction transition period, and to help ensure that wireless microphone users comply with their obligation during the transition period and cease operating on the 600 MHz band after the end of the transition period. The Commission delegates authority to its Consumer and Governmental Affairs Bureau (CGB), working with its Wireless Telecommunications Bureau (WTB) and Office of Engineering and Technology (OET), to prepare the specific language, following issuance of the *Channel Reassignment PN,* that must be used in the Consumer Disclosure and publish it in the **Federal Register**. As discussed above, there is more than one way in which the point-of-sale Consumer Disclosure may be provided to potential purchasers or lessees of wireless microphones, but each of them must satisfy all the requirements noted above, including that the disclosure be provided in writing at the point of sale in a clear, conspicuous, and readily legible manner. One way to fulfill this disclosure requirement would be to display the Consumer Disclosure in a prominent manner on the product box by using a label (either printed onto the box or otherwise affixed to the box), a sticker, or other means. Another way to fulfill the disclosure requirement would be to display the text immediately adjacent to each wireless microphone offered for sale or lease and clearly associated with the model to which it pertains. For wireless microphones offered online or via direct mail or catalog, the disclosure must be prominently displayed in close proximity to the images and descriptions of each wireless microphone. The Commission will require manufacturers, dealers, distributors, and other entities that sell or lease wireless microphones for operation in the 600 MHz Band to comply with the disclosure requirements no later than three months following issuance of the *Channel Reassignment PN,* and it encourages these entities to provide consumers with the required information earlier.

42. *Consumer Outreach.* In addition, the Commission finds that several means should be employed to provide as much notice as possible to users of the need to clear the 600 MHz Band of wireless microphones. The Commission directs CGB, working with WTB and OET, to establish a Web page on its Web site, and prepare and release consumer publications, including a Consumer Fact Sheet and answers to Frequently Asked Questions (FAQs), that inform the public of its decisions affecting wireless microphone operations in the repurposed 600 MHz Band and the guard bands, as set forth in the *Incentive Auction R&O,* this Order, and the *Part 15 Report and Order.* The Commission further directs its staff to identify and contact organizations that represent entities that are known to be users of wireless microphones in the 600 MHz Band, including groups that represent theaters, houses of worship, and sporting venues. The Commission will inform these entities of its decisions affecting wireless microphone operations in the repurposed spectrum and available resources for information on options for wireless microphone use going forward.

43. Further, the Commission expects all manufacturers of wireless microphones to make significant efforts to ensure that all users of such equipment capable of operating in the 600 MHz Band are fully informed of the decisions affecting them, as set forth in the *Incentive Auction R&O,* this Order, and the *Part 15 Report and Order.* Specifically, the Commission expects these manufacturers, at a minimum, to ensure that these users are informed of the need to clear the 600 MHz Band. Manufacturers also should inform users of wireless microphones that they may continue to operate in the 600 MHz Band until the end of the post-auction transition period, but only subject to the conditions set forth in these orders, including the early clearing mechanisms. Further, the Commission expects all manufacturers to contact dealers, distributors, and anyone else who has purchased wireless microphones, and inform them of its decisions to help clear the 600 MHz Band. Manufacturers should also provide information on these decisions to any users that have filed warranty registrations for 600 MHz Band equipment with the manufacturer. The Commission also expects manufacturers to post this information on their Web sites and include it in all of their sales literature.

44. In addition, the Commission notes that manufacturers may choose to offer rebates and trade-in programs for any 600 MHz Band wireless microphones, similar to what was done with respect to transitioning wireless microphone users out of the 700 MHz band. The Commission encourages them to consider creating or establishing such programs here. In contacting dealers and distributors, it expects manufacturers to inform these entities that they should: (1) Inform all customers who have purchased wireless microphones that are capable of operating in the 600 MHz Band of its decision to clear the 600 MHz Band of such devices; (2) post such information on their Web sites; (3) include this information in all other sales materials; (4) provide information in sales materials, including on their Web sites, on the availability of any manufacturer rebate offerings and trade-in programs related to wireless microphones operating in the 600 MHz Band; and (5) comply with the disclosure requirements that the Commission is adopting in this Order.

(b) Post-Auction Prohibition of the Certification, Manufacture, or Marketing of LPAS Devices Operating on the 600 MHz Band

45. All wireless microphones that now operate in the TV bands are certified as compliant with part 74, subpart H of the Commission's rules. The Commission decided in the *Incentive Auction R&O* that all wireless microphones that operate in the portion of the TV bands that will be repurposed 600 MHz Band for licensed wireless services may continue to operate in that spectrum during the post-auction transition period but must cease those operations no later than 39 months after release of the *Channel Reassignment PN.* At the end of the post-auction transition, licensed microphones will be permitted to operate in a portion of the duplex gap, and unlicensed wireless microphones will be permitted to operate in the guard bands and duplex gap, pursuant to the rules adopted in the *Part 15 Report and Order.*

46. In the *NPRM,* the Commission proposed to establish cutoff dates for the certification, manufacturing, and marketing of wireless microphones in the repurposed spectrum to ensure that manufacturers cease making and marketing equipment for operation in repurposed 600 MHz Band spectrum to ensure that manufacturers cease making marketing equipment that cannot be legally used after a certain date. Because similar technical requirements would apply to both licensed and unlicensed wireless microphones, the Commission proposed to apply to both the same transition rules for certification, manufacturing, and marketing in order to be the least disruptive to wireless microphone manufacturers and users. It proposed taking this action pursuant to its authority under section 302(a) of the Communications Act. This Order addresses these issues for licensed wireless microphones generally, and the *Part 15 Report and Order* addresses these issues for unlicensed wireless microphones.

47. In this proceeding, the Commission proposed that parties could no longer submit applications to certify Part 74 wireless microphones that operate in repurposed TV spectrum beginning nine months after the release of the *Channel Reassignment PN,* when the particular frequencies that will need to be vacated will first be identified. The Commission also proposed that it not certify wireless microphones under part 74 that would operate in the 600 MHz guard bands or the unlicensed portion of the duplex gap. The Commission also inquired whether parties should not be able to submit applications to certify wireless microphones that operate in repurposed TV spectrum later than 24 months after the effective date of the service rules that it adopts for licensed wireless microphones, and microphones that do not comply with the new rules may not be manufactured and marketed later than 33 months after the effective date of the service rules it adopts in this proceeding. The Commission also proposed that the effective date of any prohibition on manufacturing or marketing these devices will be 18 months after the release of the *Channel Reassignment PN.* In addition, it requested comment on the economic costs and benefits of different effective dates for the proposed prohibition on manufacturing or marketing. Finally, to the extent that the Commission determines to prohibit such manufacture or marketing, it proposed that any such ban would not apply to devices manufactured in the United States solely for export.

48. The Commission adopts its proposals for establishing cutoff dates for the certification, manufacturing and marketing of licensed wireless microphones in the TV bands, the guard bands (including the duplex gap), and the repurposed 600 MHz Band. The Commission adopts transition rules for the TV bands, the guard bands (including the duplex gap), and the repurposed 600 MHz Band that will allow it to gradually phase out older microphones and introduce new ones that are compliant with the technical rules for part 74 wireless microphones that it adopts in this proceeding and for unlicensed wireless microphones generally and for licensed wireless microphones in the duplex gap that it adopts in the *Part 15 Report and Order.* The Commission is aligning the transition periods as closely as possible with the post-auction transition schedule because this will ensure compliance with the post-auction 600 MHz Band plan and be less disruptive to wireless microphone manufacturers and users.

49. The Commission adopts the cutoff dates proposed in the *NPRM.* It will require applications to certify wireless microphones under the modified part 74 rules nine months after the release of the *Channel Reassignment PN* or no later than 24 months after the effective date of the new rules, whichever occurs first. The Commission will require that manufacturing and marketing of all part 74 wireless microphones that would not comply with the rules for operation in the 600 MHz Band cease 18 months after release of the *Channel Reassignment PN* or no later than 33 months after the effective date of the new rules, whichever occurs first.

50. The Commission recognizes that it is important to provide manufacturers with sufficient time to design new products, obtain Commission certification, and commence manufacturing. It is equally important to allow manufacturers to sell existing devices that allow the public to continue providing service until new products are available in the marketplace. The cutoff dates that the Commission adopts for certification, manufacturing and marketing of wireless microphones appropriately balance these two goals, and it disagrees with the cutoff dates proposed by CTIA and Mobile Future. Manufacturers will not know what band plan they need to design and manufacture to until after the incentive auction is concluded, and it would be unreasonable to require that only certification applications complying with the new rules be accepted at the time the *Channel Reassignment PN* is released. Broadcast stations will be vacating the 600 MHz Band over a 39 month period after the release of the *Channel Reassignment PN,* and new wireless operations will be built out gradually as broadcast stations leave the band and most likely continuing beyond the 39 month transition period. It would be unreasonable to cut off manufacturing and marketing six months into the 39 month transition period since this would deny the public access to devices that would allow them to continue to provide service. The Commission concludes that the cutoff dates it has chosen will encourage manufacturers to concentrate on developing wireless microphones that operate in compliance with new part 74 and part 15 rules and ensure that manufacturers cease making and marketing equipment that cannot be legally used after a certain date. Finally, as proposed in the *NPRM,* the prohibition on manufacture and marketing will not apply to devices manufactured in the United States solely for export.

(c) Modification of LPAS Licenses To Remove Authorization for Operations on the 600 MHz Band

51. In the *NPRM,* the Commission proposed, pursuant to its authority under section 316 of the Communications Act, to modify existing LPAS licenses to the extent necessary to delete frequencies identified as repurposed for the 600 MHz Band in the *Channel Reassignment PN,* effective on the date that the post-auction transition period ends. In addition, it proposed that, following these license

modifications, the LPAS licenses will continue to include authorization to use all frequencies currently included in those licenses other than the repurposed 600 MHz Band. Finally, the Commission proposed that if a licensed user must cease operations of a wireless microphone prior to the end of the post-auction transition period (*i.e.,* because it causes harmful interference to any 600 MHz licensee's operations), the license relating to that wireless microphone will be modified automatically without Commission action to delete the authorization to operate on the repurposed 600 MHz Band, effective on the date that operations are required to cease.

52. The Commission adopts the proposal set forth in the *NPRM.* As set forth in the *Incentive Auction R&O,* during the transition period, wireless microphone users must cease operations if they would cause harmful interference to any 600 MHz wireless operations, and if there are violations of this requirement it will enforce its rules accordingly. The Commission declines the requests to permit wireless microphone operations in the 600 MHz Band following the transition period. As the Commission explained in the *Incentive Auction R&O,* establishing a hard date by which all licensed and unlicensed wireless microphone operations must cease provides needed certainty and clarity about transitioning out of the band, and no party petitioned for reconsideration of its decision on this matter. Finally, the Commission directs WTB to modify LPAS licenses to delete the affected frequencies from LPAS licensees' authorizations, effective at the end of the transition period.

2. Miscellaneous VHF/UHF Bands

a. 26.100–26.480 MHz, 161.625–161.775 MHz, 450–451 MHz, and 455–456 MHz Bands

53. Wireless microphones operating pursuant to the part 74 LPAS rules also are authorized to operate on a licensed basis in small portions of certain broadcast bands, including the 26.100–26.480 MHz, the 161.625–161.775 MHz, the 450–451 MHz, and the 455–456 MHz bands. Eligibility for operating in these bands is limited to broadcasters and broadcast network entities. While the Commission did not propose any specific revisions concerning these rules in the *NPRM,* it sought comment on the current use of these bands for wireless microphone operations, and the more expansive use of these bands in the future. The Commission asked where there are technological advances that may promote more intensive use, and requested comment on any potential revisions that it should make to facilitate the use of these bands for wireless microphone operations.

54. Given commenters' general view that additional use of these bands is limited, and considering the small amount of spectrum they offer, revision of its rules to permit expanded operations in these bands would not yield much benefit. Furthermore, the Commission has sought comment on revising the rules in these bands to allow for the use of digital technologies of Remote Pickup (RPU) stations in another rulemaking, which could result in more intensive use of these bands. The Commission therefore concludes that it will not make these bands available for wireless microphone operations other than as currently authorized, and subject to the outcome in the latter proceeding.

b. 88–108 MHz FM Band

55. As discussed in the *NPRM,* wireless microphone operations have long been permitted in the 88–108 MHz FM band on an unlicensed basis under section 15.239 of the Commission's part 15 rules. While the Commission did not propose any rule revisions in the NPRM, it sought comment on whether wireless microphone users continue to make use of this band for their operations and the extent to which existing or revised rules will be useful for accommodating wireless microphone users' needs in the future. To the extent that revisions were proposed, the Commission requested that parties submit technical information in support of their proposals, as well as analysis of the benefits of such revisions and likely impact on FM broadcasters.

56. Based on the comments and record before the Commission, and the apparently minimal opportunity for making use of this band, it declines to make any revisions to the rules applicable to wireless microphone operations in the 88–108 MHz FM band.

3. 169–172 MHz Band

57. Under the Commission's part 90 rules, entities eligible to hold a Public Safety Pool or Industrial/Business Pool license may operate wireless microphone operations on a secondary basis on eight frequencies in the 169–172 MHz band, which is allocated primarily for Federal use. Specifically, these rules permit wireless microphones to be operated on only eight frequencies: 169.445 MHz, 169.505 MHz, 170.245 MHz, 170.305 MHz, 171.045 MHz, 171.105 MHz 171.845 MHz, and 171.905 MHz. The emission bandwidth may not exceed 54 kilohertz, the frequency stability of the microphones must limit the total emission to within ± 32.5 kilohertz of the assigned frequency, and operations may not exceed an output power level of 50 mW.

58. Wireless microphone operations are not protected from other licensed operations in the band, and must not cause interference to any Government or non-Government operations, and wireless microphone license applications are subject to Government coordination. Other non-Federal operations in the band, which also are secondary to the Federal allocation, operate on 12.5 kilohertz channels, and include (1) operations on 36 specified frequencies between 169.425 MHz and 171.925 MHz for the purpose of transmitting hydrological or meteorological data (hydro channels), (2) operations on 9 frequencies between 170.425 MHz and 172.375 MHz for forest firefighting and conservation purposes (forest firefighting channels), and (3) operations on frequency 170.150 MHz for public safety purposes and broadcast remote pickup stations in certain parts of the country. The current 169–172 MHz band wireless microphone channels overlap the hydro channels, but not the forest firefighting channels or public safety operations on frequency 170.150 MHz.

59. In the *NPRM,* the Commission sought comment on the current use of spectrum in the 169–172 MHz band for wireless microphones, and how the spectrum potentially could be used more expansively and intensively without interfering with Federal operations or the other secondary non-Federal services. It asked what steps it could take to make the band a viable option for more wireless microphone users, and sought comment on two specific approaches: Allowing wireless microphone licensees to combine each of the four neighboring pairs of channels with each other, making four larger-bandwidth channels available on new channel centers between the existing assignable frequencies; or making as much of the 169–172 MHz band as possible available for wireless microphone use and allowing operation with bandwidths of up to 200 kilohertz, subject to appropriate technical or geographic limitations.

60. As noted above, the current 169–172 MHz band wireless microphone channels overlap the hydro channels, but not the forest firefighting channels. Making as much of the 169–172 MHz band as possible available for wireless microphone use and allowing operation with bandwidths of up to 200 kilohertz on center frequencies throughout the band, as advocated by the commenters,

would result in wireless microphone channels overlapping forest firefighting channels. In another proceeding, a petition for rulemaking proposed to make the forest firefighting channels available for vehicular repeater systems (VRS) and other mobile repeaters by other firefighters fighting in-building fires. Despite the benefits that VRS use provides for first responders, the Commission denied that portion of the rulemaking petition. It noted concerns expressed by the National Telecommunications and Information Administration that an interference-free environment must be maintained on the forest firefighting channels because even VRS public safety operations on a secondary basis would pose a risk of creating conflicts with primary Federal safety operations. Consistent with this precedent, the Commission declines to allow wireless microphone operations on center frequencies throughout the band that would overlap forest firefighting channels.

61. The Commission agrees with commenters that it should promote more opportunities for wireless microphone use of this band. Consequently, the Commission will pursue the approach of creating new channel centers between the existing neighboring pairs of channels (*i.e.,* 169.475, 170.275, 171.075, and 171.875 MHz). The Commission concludes that the record supports permitting operation on these new channel centers with a bandwidth of up to 200 kilohertz, rather than merely combining the existing channels into new channels with a bandwidth of less than 120 kilohertz, because 200 kilohertz bandwidth will support higher audio quality, which could facilitate operation in the band by a wider range of users. Wireless microphones that have bandwidth exceeding 54 kilohertz will be required to comply with the emission masks in Section 8.3 of ETSI EN 300 422–1 v1.4.2 (2008–11) that the Commission is adopting for licensed wireless microphone operations in the TV bands.

62. In order to protect Federal operations and the other secondary non-Federal services, the Commission rejects the suggestion that it authorize wireless microphone operations in the 169–172 MHz band on an unlicensed basis pursuant to part 15. Unlicensed operations would eliminate the Federal Government's ability to review and object to new assignments in this primary Federal band. Instead, these operations will be licensed pursuant to part 90 and applications will be subject to Government coordination.

4. 944–952 MHz Band and Adjacent 941–944 MHz and 952–960 MHz Bands

63. In the *NPRM,* the Commission sought comment on making revisions to the rules in the 944–952 MHz band and the two adjacent bands, the 941–944 MHz and 952–960 MHz bands, to accommodate additional licensed wireless microphone operations.

a. 944–952 MHz Band

64. The Commission's part 74, subpart H rules authorize operations of wireless microphones on a licensed basis in the 944–952 MHz band. These LPAS operations are authorized on a co-primary basis along with other Broadcast Auxiliary Services (BAS) consisting of fixed Aural Studio to Transmitter links (STL) stations and fixed Aural Intercity Relay Links stations (ICR). Entities eligible for a license to operate wireless microphones are limited to broadcast licensees and broadcast network entities. LPAS devices using this particular band of spectrum may also be used to transmit synchronizing signals and various control signals to portable or hand-carried TV cameras which employ low power radio signals in lieu of cable to deliver picture signals to the control point at the scene of a remote broadcast. Under the applicable technical rules, the operating bandwidth for LPAS operations may not exceed 200 kHz, and the maximum transmitter power is 1 watt. Several manufacturers have developed wireless microphones that use this band.

65. In the *NPRM,* the Commission sought comment on potential for more intensive use of this band for the licensed wireless microphone operations among the other BAS that use the band. It asked whether, considering that less spectrum may be available for wireless microphone operations in the UHF television bands, licensees expect to make greater use of this band in this band by migrating particular types of uses to this spectrum when they are spectrum-constrained in the TV bands, and whether this band is well-suited for high-quality uses. Because the Commission had proposed adopting ETSI standards for operations in the TV bands, it also proposed adopting these standards for LPAS operations in the 944–952 MHz band.

66. The Commission also proposed expanding eligibility in the 944–952 MHz band to include all of the entities currently eligible under part 74 for licensed operation of LPAS devices in the TV bands, given that their wireless microphone needs are similar to those of broadcasters and broadcast network entities. It asked whether technical limitations and other considerations should be weighed when assessing expansion of licensee eligibility in this band to ensure that such eligibility expansion would not be problematic for existing LPAS operations in this band.

67. Consistent with this record and in accord with adoption of the ETSI standard on emission masks for LPAS devices in the TV bands, the Commission will require that emissions from analog and digital wireless microphones comply with the emission masks in Section 8.3 of ETSI EN 300 422–1 v1.4.2 (2011–08), for future wireless microphones that will use this band—applying these revised standards to new equipment certified under Part 74 in the 944–952 MHz band 9 months after issuance of the *Channel Reassignment PN,* consistent with the requirements for new equipment certified for LPAS devices that operate in the TV bands. Further, the Commission expands eligibility for operations in the 944–952 MHz band to include all entities currently eligible to hold LPAS licenses for operation in the TV bands. This step should help address the need for additional spectrum outside of the TV bands for this entire group of licensed users.

68. Licensed LPAS users operating in the 944–952 MHz band (as in the TV bands) are subject to the frequency selection requirements contained in § 74.803 of its Rules. The Society of Broadcast Engineers (SBE) runs a local frequency coordination program for this band and asserts that coordination would have to be mandatory in order to avoid interference among different licensees. Accordingly, the Commission will also require wireless microphone users seeking access to this band to coordinate their proposed use through the local SBE coordinator.

b. 941–944 MHz Band and 952–960 MHz Band

69. The two bands immediately adjacent to 944–952 MHz band—the 941–944 MHz and the 952–960 MHz bands—are licensed for fixed services in varying bandwidths (from 12.5 kHz up to 200 kHz) in different areas and segments of these eleven megahertz. Most of the spectrum in these two bands is licensed for Private Operational Fixed (including business industrial and public safety) and Common Carrier Fixed Microwave Services authorized under part 101, and fixed Aural Broadcast Auxiliary Services (STL and ICR) authorized under part 74, while smaller portions are authorized for Multiple Address Systems (MAS), which consist of point-to-multipoint

Fixed Microwave Services authorized under part 101 of the rules.

70. Specifically, most of the 941–944 MHz band—the two and a half megahertz between 941.5–944 MHz—is available for licensing for Private and Common Carrier Fixed Microwave Services or for broadcast auxiliary stations. Fixed point-to-point links in these bands are typically used for long distance low data-rate links between locations that have line of sight capability. They employ directional antennas and operate with fairly high effective isotropic radiated power. Receive antennas are also directional, affording some rejection of unwanted signals off-axis from the main lobe of the antenna. The other portion, the half megahertz between 941–941.5 MHz, is authorized for MAS operations, specifically communications from MAS master stations to remote stations; consequently, transmission from the master station is generally omni-directional, generally within a 25-mile radius, to many remote stations. MAS historically has been used by the power, petroleum, and security industries for various alarm, control, interrogation and status reporting requirements as well as by the paging industry, and the licensing scheme adopted by the Commission was designed to accommodate these past and present uses. MAS licenses in this band are either geographically-based or site-based.

71. Most of the 952–960 MHz band—6.8 megahertz of spectrum between 952.85–956.25 MHz and 956.45–959.85 MHz—is licensed for Private Operational Fixed Microwave Service (including business industrial and public safety) authorized under part 101. The remaining portions of the band are also authorized for MAS operations in three distinct portions, totaling 1.2 megahertz. The MAS bands are divided into two groups with differing licensing and service characteristics; these are commonly known as the 928/952/956 band—used for private internal or public safety communications, and the 928/959 MHz band—used by CMRS and paging network incumbents. The MAS portions of these bands have historically been used by the power, petroleum, and security industries for various Supervisory Control and Data Acquisition (SCADA) operations as well as by the paging industry. These licenses also could be either geographically-based or site-based.

72. In the *NPRM,* the Commission proposed making unused portions of the 941–944 MHz and the 952–960 MHz bands available for licensed wireless microphone operations on a secondary basis, generally under the rules applicable for LPAS operations in the 944–952 MHz band, provided that incumbent users in the band could be protected from interference. The Commission inquired about the extent to which there are many locations in these bands where spectrum is unused, potentially available, and in sufficient bandwidth (*e.g.,* 200 kHz) suitable for wireless microphone uses similar to their uses in the TV bands and 944–952 MHz band. Considering the different services and service rules that apply to portions of these bands, and the mix of point-to-point and point-to-multipoint services already operating in these bands, the Commission asked whether specific sub-bands would be more suitable than others for sharing with wireless microphones. In this regard, it first inquired about those portions of the spectrum available for licensing for fixed microwave services, which constitutes the majority of the spectrum in these bands. The Commission sought comment on the ability of wireless microphone users to determine the availability of suitable spectrum at particular locations in these portions of the band, and what issues or factors it should take into account to make spectrum available for wireless microphone operations while protecting the incumbent fixed services that operate in these bands. The Commission then made similar inquiries about making the portions of the spectrum in these bands that are authorized for MAS operations available for wireless microphone operations. Considering that many MAS systems are used by utilities for SCADA operations, it sought comment on whether these existing users operate in the same general geographic areas as wireless microphone users, or whether the wireless microphone operations would be separated geographically because these are different types of uses. It also asked about other factors that it should consider when determining whether and how to permit wireless microphone operations in these MAS portions.

73. The Commission also sought comment on designing rules that would be necessary to address any interference concerns with particular incumbent operations that could arise. It asked whether certain types of services, such as fixed microwave services, would generally not be prone to interference, and whether others, such as MAS operations involving SCADA operations, could be more susceptible to interference and require more protected rules (*e.g.,* rules to specify minimum separation distances, or create protection zones, or imposed greater limitations on power levels used by wireless microphones, or restricting use to indoors). In addition, the Commission sought comment on the technical rules that would apply to wireless microphone operations in these bands. It specifically asked whether wireless microphones should be permitted to operate under the same technical rules for LPAS operations that apply to operations in the 944–952 MHz band (*e.g.,* power limits, maximum bandwidth, Out of Band Emissions (OOBE), including the ETSI standards that it proposed to apply to such operations. Finally, it sought comment on the equipment issues that would pertain to wireless microphone operations in these bands, including various issues relating to the certification process (*e.g.,* whether manufacturers should be able to certificate equipment under the same rules and procedures for LPAS devices that operate in the 944–952 MHz band, or needed to develop new equipment for these bands that would be certificated in a different manner).

74. Based on the record before us, the Commission will open most of the 941–944 and 952–960 MHz bands—the 2.5 megahertz of spectrum between 941.5–944 MHz and the 6.8 megahertz of spectrum between 952.85–956.25 MHz and 956.45–959.85 MHz—for use by wireless microphones and other LPAS license eligible entities currently operating in the TV broadcast bands and for whom it has expanded eligibility to operate in the 944–952 MHz bands. Because wireless microphones operate at low power over short distances, and fixed point-to-point systems employ directional antennas and operate with fairly high effective isotropic radiated power, the Commission believes that the risk of interference between LPAS operations and fixed point-to-point operations is low, and commenters generally agree with that conclusion. The Commission finds further support for its decision in parties' assurances that equipment to utilize these expanded bands could be brought to market quickly. Furthermore, it finds that LPAS operations in the these bands should be subject to the same part 74 technical rules that apply to LPAS operations in the 944–952 MHz band (*e.g.,* the same power limits, maximum bandwidth, and coordination requirements). The Commission also adopts the ETSI standard for emission masks in Section 8.3 of ETSI EN 300 422–1 v1.4.2 (2011–08); and will require emissions beyond +/− 1 MHz from the carrier or center frequency to be

attenuated by 90 dB. It will apply this standard to new licenses in the 941.5–944 MHz, 952.85–956.25 MHz and 956.45–959.85 MHz bands upon the effective date of this order. Consistent with the coordination requirements the Commission adopted for the 944–952 MHz band, it will also require wireless microphone users seeking access to the 941.5–944 MHz, 952.85–956.25 MHz and 956.45–959.85 MHz bands to coordinate their proposed use through the local SBE coordinator.

75. The Commission does not, however, open the remaining portions of the bands authorized for MAS operations, in three distinct portions totaling 1.7 megahertz, for licensed wireless microphone operations. Unlike with fixed point-to-point operations, it concludes that there is a greater risk of interference from a wireless microphone being operated at close proximity to a MAS remote station. Unlike fixed point-to-point operations (including BAS studio transmitter links), geographic area MAS licensees may add master and remote stations throughout their service area without prior Commission approval, and incumbent MAS licensees are allowed to expand their systems under certain circumstances. Given the record before the Commission, including the concerns of representatives of MAS interests, it concludes that proponents of using the MAS bands for wireless microphones have not demonstrated that they can coexist with MAS without causing interference. Furthermore, there is only a relatively small amount of spectrum in discrete segments potentially unused and available in this 1.7 megahertz.

5. Unlicensed Operations in the 902–928 MHz, the 2.4 GHz, and the 5 GHz Bands

76. The 902–928 MHz, 2.4 GHz (2400–2483.5 MHz), and 5 GHz (5725–5850 MHz) bands generally permit operations of unlicensed devices pursuant to two part 15 rules, 47 CFR 15.247 and 15.249. Wireless microphones are among the devices that operate on an unlicensed basis in these bands under these rules.

77. In the *NPRM,* the Commission sought general comment on the current and potential uses of the band for various wireless microphone operations, the types of applications for which the bands are best suited, the limitations associated with use of these bands, and technological advances that have improved the ability to make use of the band for wireless microphone operations. In requesting information on the use of these bands, it sought to develop a more complete record of how these bands are useful in meeting various needs of wireless microphone users. The Commission did not propose to revise any of these part 15 rules that apply to a broad range of unlicensed operations.

78. The Commission concludes that although the use of these bands at this time may be more appropriate for certain types of wireless microphone applications, they nonetheless can support devices that are part of the suite of wireless microphone devices that accommodate the needs of various users. It also anticipates that further technological advances can make improvements in performance, and hence make use of these bands more attractive for meeting many wireless microphone users' needs. As noted above, the Commission did not propose to make any revisions of the rules applicable for a wide range of unlicensed uses in these bands, and decline here to make any revisions. It generally is not inclined to make changes to these rules without demonstrated need that changes would benefit the many users of these bands.

6. 1920–1930 MHz Unlicensed PCS Band

79. The 1920–1930 MHz band is allocated to Fixed and Mobile services on a primary basis and is designated for use by Unlicensed Personal Communications Service (UPCS) devices under the Commission's part 15 rules for unlicensed operations. To facilitate the sharing of spectrum in the UPCS band, the current rules require use of a ''listen-before-transmit'' protocol that specifies a process for monitoring the time and spectrum windows that a transmission is intended to occupy for signals above a defined threshold. Digital Enhanced Cordless Telecommunications (DECT) technology may be used in this band since it complies with the general rules for operating in this band. DECT-based radio technology facilitates voice, data, and networking applications with range requirements up to a few hundred meters. DECT technologies minimize interference and can be particularly effective for voice communications, and many manufacturers make wireless microphones that use this spectrum.

80. In the *NPRM,* the Commission invited comment on the current and potential uses of the 1920–1930 MHz UPCS band for wireless microphone applications, advances in wireless microphone technologies making use of this spectrum, and the types of applications for which it may be best suited. It did not propose any revisions, but did ask generally whether it should consider any technical revisions that could make this band more useful for wireless microphone applications without adversely affecting operations of other users in the band.

81. As discussed above, wireless microphone manufacturers are finding ways under the existing rules to make use of this unlicensed band to address particular types of wireless microphone users' needs. The Commission encourages wireless microphone users to make use of this band where it can effectively serve their needs. It did not propose revisions to the rules in this band, and recognizing the many other applications that make use of this band, it will not make revisions at this time.

7. 1435–1525 MHz Band

82. The 1435–1525 MHz band (1.4 GHz band) is shared by the Federal government and industry for aeronautical mobile telemetry (AMT) operations. AMT systems are used for flight testing of manned and unmanned aircraft, missiles, and space vehicles, and associated communications such as range safety, chase aircraft, and weather data. The Department of Defense (DOD) is the major Federal user of the band, although the National Aeronautics and Space Administration (NASA) and the Department of Energy (DOE) also have assignments within it. The commercial aviation industry uses the band for flight testing of new and modified commercial, corporate, and general aviation aircraft at various facilities across the United States. Both the FCC and NTIA recognize the Aerospace and Flight Test Radio Coordinating Council (AFTRCC) as the non-governmental coordinator for assignment of flight test frequencies in the band. Through the Special Temporary Authority (STA) process, professional sound engineering companies responsible for major event productions have obtained authority to operate both wireless microphones (and similar audio devices) and video equipment on a temporary basis (*e.g.,* a few days or a week) to access this spectrum. These STAs supplement the parties' existing access to other spectrum resources (primarily the TV bands) for coverage of sporting and other public events at specified locations around the country. Under existing practice, the applicants have had to demonstrate that they have fully coordinated their proposed spectrum use with AFTRCC before the Commission will grant a STA. The STAs have provided the applicants access to up to 90 megahertz of spectrum in the 1435–1525 MHz band, and only when that spectrum is not subject to AMT use at the specified times and locations.

Operators generally use equipment that has been specially developed or modified for use of the 1.4 GHz band spectrum.

83. In the *NPRM,* the Commission proposed making the 1.4 GHz band spectrum available for use by wireless microphones on a secondary licensed basis, with use limited to licensed professional users at specified locations and times operating pursuant to specified safeguards designed to protect AMT use of the band. It sought general comment on the suitability of this spectrum for wireless microphone operations, and stated its commitment to ensuring that any wireless microphones operating in this spectrum are spectrally efficient and frequency agile.

84. While the Commission sought to provide wireless microphone users in need of additional spectrum resources with access to the 1.4 GHz band spectrum to help accommodate those needs, it contemplated only limited use of this spectrum and did not propose to open it for either widespread or itinerant uses throughout the nation. In particular, the Commission proposed that wireless microphone uses be restricted to specific fixed locations, such as large venues (whether outdoor or indoor), where there may be a need to deploy large numbers of microphones (*e.g.,* 100 or more), and only at specified times. It proposed limiting eligibility to professional users, including broadcasters, professional television and cable programmers, and professional sound engineering companies, and operators at major venues that manage and coordinate wireless microphone operations, *i.e.,* the entities eligible for licensed LPAS operations in the TV bands. In proposing to require prior coordination with AFTRCC, the Commission sought comment on specific coordination mechanisms that would ensure that wireless microphone operations only occur at the locations and times where authorized, and would be effective in preventing the use of these devices at any other location or time without authorization.

85. In considering the appropriate framework for wireless microphone operations in the band, the Commission noted that it already permits secondary, low power short-range Medical Body Area Network (MBAN) devices to share use of another band where AMT operations are primary (*i.e.,* the 2360–2390 MHz band) pursuant to a specified coordination process. The Commission asked about the extent to which the rules for MBAN operations might serve as a model for rules that it should adopt for wireless microphone operations in the 1.4 GHz band. MBAN device operators are required to register each device with the frequency coordinator and provide specified information—including the frequencies to be used, the location of the devices, the power levels used, and point of contact information regarding the entity responsible for the MBAN device operations. MBAN devices also must cease transmission in the absence of a control message. The Commission further noted that, as part of the MBAN proceeding, it had recognized that specific tools, such as electronic keys, could be useful to coordinators as they sought to achieve mutually agreeable coordination agreements.

86. The Commission sought comment on requiring that wireless microphone systems, which often are moved from one location to another (*e.g.,* when used to cover different events), could only operate through use of an automatic mechanism (such as an electronic key, and location-awareness capability, or similar mechanisms) that would serve to prevent wireless microphones from operating unless on approved frequencies in the 1.4 GHz band at the approved location/venue(s) during approved time(s). In addition, the Commission invited comment on whether it should adopt point-of-sale restrictions that would enable only entities licensed to operate in this band (discussed below) to obtain the devices.

87. To the extent the Commission decided to authorize wireless microphone operations in this band, it sought comment on the technical rules that would apply to devices that would use the band, including considerations designed to ensure that the primary AMT operations would be protected. It asked whether the technical rules should be the similar to those that apply to wireless microphones that operate in other bands, as well as whether ETSI standards should be adopted for those devices. To preserve maximum flexibility for wireless microphone operations in the band, it inquired whether it should require wireless microphones to have the capability of tuning across the band, as well as whether wireless microphones designed to operate in the 1.4 GHz band should have modular transmitting components that, if necessary, could be replaced to enhance frequency agility. In addition, the Commission asked whether there should be an interim process for permitting wireless microphone operations in the band as any necessary new devices are being made, and what device certification process should be employed. Finally, consistent with its proposal, the Commission envisioned adding a secondary mobile except aeronautical mobile service allocation to the 1435–1525 MHz band for limited use under the service rules it adopts for the band.

88. As proposed in the *NPRM,* the Commission authorized limited use of the 1.4 GHz band for licensed wireless microphones operations, with secondary status in the band in the table of allocations, and only provided that certain conditions and safeguards designed to protect AMT services are met. Experience through the STA process demonstrates that, under proper conditions, wireless microphones will be able to operate in this band without interfering with the critical aeronautical flight test operations that rely on primary access to this spectrum. Eligibility to use this band will be restricted to professional users (to include broadcasters, professional television and cable programmers, and professional sound engineering companies, and operators at major venues that manage and coordinate wireless microphone operations). The Commission also adopted Shure's recommendation, and will permit 200 kHz analog and digital masks and adopt the emission masks in Section 8.3 of ETSI standard EN 300–422–1 v1.4.2 (2011–08), with power levels of up to 250mW consistent with the rules for UHF operations in the TV bands. To accommodate this limited use, the Commission is adding a new footnote, US84, to the Table of Frequency Allocations. This footnote explicitly permits secondary wireless microphone use in the 1435–1525 MHz band, which is already allocated to the mobile service on a primary basis but restricted to aeronautical telemetry.

89. As proposed in the *NPRM,* the Commission is only authorizing limited use of this spectrum for licensed wireless microphone uses, where access may be important for certain specified events. It is not opening up this band either for widespread use or for itinerant uses throughout the nation. In particular, it is restricting use to specific fixed locations, such as large venues (whether outdoor or indoor), where there is a need to deploy large numbers of microphones (typically 100 or more) for specified time periods, for situations in which the other available spectrum resources are insufficient.

90. Protection of primary service in the band by this new secondary service is of paramount importance. Wireless microphone use in the band must be coordinated with the non-governmental coordinator for assignment of flight test frequencies in the band (*i.e.,* AFTRCC), and authentication and location

verification will be required before a coordinated wireless microphone begins operation. Wireless microphones operating in this band must also be tunable across the entire 1435–1525 MHz band, as recommended by AFTRCC. This capability will facilitate coordination with incumbent users whose aeronautical testing may be variable across the band. Additionally, the Commission will authorize all microphones operating in a particular area to access no more than 30 megahertz in the 1435–1525 MHz band. This requirement will facilitate coexistence in the band by ensuring that wireless microphones operating be able to coordinate around AMT operations and by promoting the development of spectrally efficient technologies (*e.g.,* digital technologies). The Commission also emphasizes that the STA process remains available to address extraordinary situations or special events requiring more spectrum access.

91. The Commission is convinced that many of the elements that led to the successful adoption of the final MBAN service rules will also promote licensed secondary wireless microphone use of the 1.4 GHz band. Chief among these will be the cooperation of the AMT community in recognizing opportunities to share use of the band in those locations and times that will not interfere with the critical existing primary use, and the implementation of a coordination process to allow for such determinations in a timely and effective manner. However, the Commission recognizes that this coordination scenario is different from the MBANs case in that the secondary use will not be restricted to indoor locations in relatively limited and well-defined geographic places (*i.e.,* hospitals). The Commission thinks there is good basis for AFTRCC's suggestions that equipment authentication be done through an automated mechanism and repeated regularly, that the equipment be designed to automatically cease operation in the absence of such registration and authentication, and that the equipment incorporate a geolocation capability more sophisticated than the manual entry of coordinates. Accordingly, the Commission will require manufacturers to design, and operators to use, software-based controls (or similar functionality) to prevent devices from operating in the band except in the specific channels coordinated with AFTRCC for any given location.

92. The Commission will leave the details of these matters for resolution at a future time, to be informed by further negotiation between manufacturers and the flight test community. It is also not mandating, at this time, the use of a specific coordinator or coordinators to represent the wireless microphone community (analogous to the MBAN coordinator). The decision as to whether such a coordinator may be appropriate for the professional licensed wireless microphone user base (and consideration of whether such a coordinator would provide sufficient user oversight so as to allow greater flexibility in how 1.4 GHz wireless microphone equipment may be designed) will be better informed after further discussion by the interested parties.

93. The Commission's intent is to provide a stable new environment for professional wireless microphone users, but it must also be mindful of the fact that, as noted above, wireless microphone use of the 1.4 GHz band will operate pursuant to a secondary allocation. In light of this regulatory status, and considering the history of wireless microphone users having to replace equipment as band availability has evolved, the Commission strongly encourages parties designing equipment for this band to incorporate design elements—such as modular transmitting components or wider tuning capability extending to other bands—that will allow the greatest future flexibility should regulatory circumstances ever change. The Commission reminds licensees and manufacturers that they will bear the future cost of any such changes and, therefore, that relatively small upfront costs to increase flexibility may prevent much greater costs associated with replacing equipment in the unforeseeable future. It intends to continue a dialog with the wireless microphone community so that licensees and manufacturers will be able to anticipate, well in advance, any new developments (*e.g.,* the availability of other bands for wireless microphones) that might inform the design of new equipment.

94. While the Commission concludes that the costs of the particular requirements it is establishing for wireless microphone use of the 1.4 GHz band are outweighed by the benefits of allowing licensed secondary use in a band that would otherwise not be available, it recognizes that the requirements are likely to limit 1.4 GHz wireless microphone use to a relatively limited community of professional users. The limited size of the user pool will facilitate coordinated use of the band and mitigate successfully AFTRCC's concerns regarding unauthorized users. The Commission also expects wireless microphone manufactures to continue to innovate and find further operational efficiencies, and believe that they will be able to draw on the experiences of MBAN proponents as they develop equipment designed to operate in the AMT space. Finally, because the Commission will continue to allow for the existing coordinated use of this band under the STA process, it is not establishing an interim process for permitting wireless microphone use under the new procedures pending the development of new equipment and final coordination and registration requirements.

8. 3.5 GHz Band

95. In the *NPRM,* the Commission noted the *3.5 GHz Band FNPRM* adopted earlier in 2014, in which it sought comment various potential uses of the 3.5 GHz band as it developed rules for operating in that band, *see* 79 FR 31247, June 2, 2014. It made clear that all of the issues regarding the policies and rules for operations in the 3.5 GHz proceeding would be decided in that proceeding, but nonetheless sought general comment on whether wireless microphone operations potentially could be employed in the 3.5 GHz band to help accommodate particular needs of users.

96. In April 2015, the Commission adopted rules for commercial use of 150 megahertz in the 3.5 GHz band, *see* 80 FR 34119, June 15, 2015. These rules specified a federal/non-federal sharing arrangement of that band as part of a broader three-tiered sharing framework, which included Priority Access and General Authorized Access (GAA) tiers of service for commercial wireless use. This band potentially can provide opportunities for wireless microphone operations. Both tiers of service are open to any party eligible for a Commission license and could provide opportunities for wireless microphone operations.

9. 6875–7125 MHz Band

97. As the Commission discussed in the *NPRM,* the 6875–7125 MHz band (7 GHz band) has long been authorized for shared co-primary use for fixed microwave operations among TV BAS stations (including television studio-transmitter links, television relay stations, and television translator relay stations) under part 74 and cable television relay stations (CARS) under part 78 of its rules. Broadcast network and cable entities may also use the band on a secondary basis for mobile or temporary fixed microwave operations for TV and CARS pickup stations. In addition, broadcasters can operate certain BAS facilities in the 7 GHz band

on a short-term, secondary basis without prior authorization for up to 720 hours a year. The BAS stations make it possible for television and radio stations and networks to transmit program materials from the sites of breaking news stories or other live events to television studios for inclusion in broadcast programs. The CARS stations enable cable operators to distribute programming to microwave hubs where it is impossible or too expensive to run cable and to cover live events. In 2011, the Commission also authorized Fixed Services (FS) microwave operations under part 101 (for Private, Common Carrier, or Public Safety microwave systems) to share use of the band, on a co-primary basis, but only in areas where BAS and CARS television pickup operations are not licensed and not on two 25 megahertz channels in the middle of the band reserved for TV pickup stations (channels at 6975–7000 MHz and 7000–7025 MHz).

98. The 250 megahertz in the 7 GHz band is comprised of ten 25 megahertz channels. BAS and CARS licensees may be authorized to operate both fixed and mobile stations on any of these channels, and FS licensees on all but two of them (as noted above). The Commission has not otherwise adopted a formal, nationwide segmentation plan for the 7 GHz band to separate fixed and mobile operation. BAS and CARS licensees are authorized to operate on 25 megahertz channels, FS operators may be authorized to operate on 25 megahertz channels or on smaller channels of 5, 8.33 or 12.5 megahertz. Furthermore, all fixed BAS, CARS, and part 101 FS stations must engage in the same frequency coordination process required of all part 101 services, whereas temporary fixed or mobile TV pickup services continue to be subject to informal coordination procedures within their service areas.

99. In the *NPRM,* the Commission proposed to permit licensed wireless microphone operations on available channels in this band, on a secondary basis, for entities eligible to hold BAS or CARS licenses. Considering the likelihood of significant areas of unused spectrum throughout this band, the Commission sought comment on whether spectrum in this band could be made available for relatively low power, short-range wireless microphone operations without interfering with existing services. Given that BAS and CARS licensees already use the 7 GHz band for certain types of video applications and programming production, it asked whether there would be synergies in permitting wireless microphone operations that could supplement those existing applications. The Commission sought comment on particular rules that could facilitate wireless microphone operations in the band while also protecting existing services, specifically inquiring whether it should make spectrum in all of the 7 GHz band available for wireless microphone operations on a secondary, non-interfering basis, or only make certain portions of the 7 GHz band available for wireless microphone operations. It also sought comment on what technical rules (LPAS or otherwise) would best facilitate wireless microphone operations in the band, whether such rules should include the ETSI standards, and what if any interference criteria such as geographic exclusion zones or OOBE limits would protect incumbent services in the band. Given that coordination among licensees currently is required, the Commission asked to what extent formal or informal coordination of wireless microphone operations should be required—*i.e.,* whether wireless microphone users could share operations among themselves on the same private-sector, frequency-coordinated basis that exists for the use of BAS mobile shared spectrum. Finally, it sought comment on the availability of wireless microphone equipment for this band.

100. The Commission will permit BAS and CARS eligible entities, as well as the other entities eligible to hold LPAS licenses under part 74, to operate wireless microphones on a licensed, secondary basis in the 7 GHz band on two 25 megahertz channels that it will set aside for such use on the top and bottom channels of this band (6875–6900 MHz and 7100–7125 MHz). It declines to make the entire band available for wireless microphone use because there has been no demonstration that there is a need for all 250 megahertz of spectrum to be made available for wireless microphone use. The Commission is particularly concerned about compatibility between wireless microphones and itinerant BAS operations in the two channels reserved for nationwide use. SBE originally supported use of one 25 megahertz channel in the band, and by offering twice as much spectrum, the Commission hopes to create the necessary flexibility for wireless microphones to opportunistically find frequencies they can use on a secondary basis without interfering with, or receiving interference from, primary users with whom they must share and who typically operate at a higher power. Additionally, the Commission is reassured in its approach to the 7 GHz band by the commenters stating that equipment for these bands is readily available internationally and could be easily brought to market. While Broadcast Sports, Incorporated (BSI) favored setting aside 13 megahertz spectrum segments only for wireless microphone use on a primary basis, the Commission declines to do so because the 7 GHz band should remain fully available for BAS, CARS, and point-to-point operations. It is concerned that granting LPAS exclusive or co-primary status could impede the growth of the important existing uses of the band. Furthermore, under the Commission's existing rules, LPAS users are required to avoid causing harmful interference to any other class of station authorized under its rules or the Table of Allocations. BSI has not explained why a different rule is necessary or appropriate in the 7 GHz band. Moreover, the Commission has endeavored to make two 25 megahertz channels available at the top and bottom of the band (more than BSI requested) so that wireless microphones will have additional flexibility to select specific frequencies within the channel that will not cause interference to other services in the bands.

101. With respect to coordination, generally, in lieu of mandating specific interference criteria in its rules, the Commission expects applicants and licensees to work out interference issues in the frequency coordination process. FS, BAS, and CARS (other than mobile or temporary fixed operations) already operate in the 7 GHz band subject to a formal Part 101 coordination process pursuant to which all fixed station applicants must provide affected licensees and contemporaneous applicants with 30-day prior notification and an opportunity to participate in frequency coordination before filing their applications with the Commission. Mobile and temporary fixed stations are generally coordinated through local SBE coordinators pursuant to the requirements in section 74.638(d). The Commission will require new wireless microphone operations in the band to coordinate their operations through the local SBE coordinator. It will permit licensees to aggregate channels in these bands for wider-band transmission. Finally, it will apply the same part 74 technical rules applicable to wireless microphones in the TV broadcast bands to their operations in these bands, require that wireless microphones comply with the emission masks in Section 8.3 of ETSI EN 300 422–1 v1.4.2 (2011–08) and will require

that emissions beyond +/ − 1 MHz from the carrier or center frequency to be attenuated by 90 dB.

10. Ultra-Wideband

102. The Commission's rules for ultra-wideband (UWB) unlicensed devices are set forth in part 15, subpart F. Operating pursuant to the technical rules set forth in part 15, UWB devices can use spectrum occupied by existing radio services without causing harmful interference, thereby permitting scarce spectrum resources to be used more efficiently. Wireless microphones operating under these rules would be required to operate pursuant to the UWB rules for communications systems, which permit operations in the 3.1–10.6 GHz band. Under the UWB rules, these devices must be designed to ensure that operation can occur indoors only, or must consist of hand-held devices that may be employed for such activities as peer-to-peer operation. The Commission noted that at least one wireless microphone manufacturer has developed and markets wireless microphones that operate under these rules.

103. In the *NPRM,* the Commission sought comment on the current and potential uses of UWB devices for wireless microphone applications. It asked whether there are there particular uses for which wireless microphones operating under UWB rules are well suited, such as indoor and/or short-range operations, and whether manufacturers are promoting the use of UWB wireless microphones for particular applications. Finally, it invited comment regarding steps that it should take to facilitate use of UWB devices for wireless microphone uses. It did not propose or seek comment on any rule revisions that would be designed to accommodate wireless microphone applications.

104. While the Commission did not propose, nor is it adopting, any changes to these rules, it does encourage further developments that can enable various wireless microphone applications to meet particular consumers' needs. Any changes to the existing rules would require much more extensive technical justification and analyses, as an initial matter, which are not before the Commission.

11. Other Potential Bands

105. In the *NPRM,* the Commission invited comment on whether there are other bands not currently available for wireless microphone operations that may be useful in helping to accommodate their needs, whether in the nearer term and over the longer term. In particular, the Commission inquired about the 2020–2025 MHz band, asking whether this band might be technically suitable for wireless microphone operations, the potential equipment availability, and other issues that would need to be considered. It also requested comment on how a decision to permit wireless microphone operations in this band would affect its earlier decision to allocate those five megahertz for non-federal fixed and mobile service, whether allowing access would be helpful in accommodating wireless microphone operations, and whether use of this band for wireless microphones would advance its spectrum management goals, including promoting efficient use of spectrum.

106. The Commission declines to take any action with respect to 2020–2025 MHz at this time. In the *NPRM,* it asked commenters who were interested in this band to address the technical suitability of this band for wireless microphones, to identify the potential availability of equipment for operations in the band, and to explain how wireless microphone use would be consistent with the Commission's earlier decision to allocate this band for non-federal fixed and mobile service. It also sought comment on how permitting wireless microphone operations would be advance spectral efficiency and other spectrum management goals. While certain parties express support for using this band for wireless microphones, the record currently before the Commission does not provide sufficient basis to make this spectrum available for wireless microphone operations at this time, particularly in light of the substantial steps it takes in this R&O to accommodate wireless microphone operations in other bands. Accordingly, while the Commission does not foreclose future consideration of wireless microphone operations in the 2020–2025 MHz band, it is not permitting wireless microphone access to this band at this time.

III. Procedural Matters

A. Paperwork Reduction Analysis

107. This Report and Order contains new or modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104–13. It will be submitted to the Office of Management and Budget (OMB) for review under section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new or modified information collection requirements contained in this proceeding. In addition, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107–198, 44 U.S.C. 3506(c)(4), the Commission previously sought specific comment on how it might further reduce the information collection burden for small business concerns with fewer than 25 employees.

B. Final Regulatory Flexibility Analysis

108. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] and Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the in the Notice of Proposed Rule Making (NPRM), Promoting Spectrum Access for Wireless Microphone Operations, GN Docket No. 14–166 and Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, GN Docket No. 12–268.[2] The Commission sought written public comment on the proposals in the NPRM, including comment on the IRFA. This present Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.[3]

C. Need for, and Objectives of, the Report and Order

109. In this Report and Order, we take several actions to accommodate wireless microphone users' needs in the coming years. Many types of users employ wireless microphones in a variety of settings. Wireless microphone operations range from professional uses, with the need for numerous high-performance microphones along with other microphones, to the need for a handheld microphone to transmit voice communications, to a range of different uses and needs for different numbers of microphones in different settings. Through these actions, we seek to enable wireless microphone users to have access to a suite of devices that operate effectively and efficiently in different spectrum bands and can address their respective needs.

110. We adopt several changes in our rules for operations in the TV bands, where most wireless microphone operations occur today. With respect to the TV bands, we revise our rules to provide more opportunities to access spectrum by allowing greater use of the VHF channels and more co-channel

[1] *See* 5 U.S.C. 603. The RFA, *see* 5 U.S.C. 601–612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. 104–121, Title II, 110 Stat. 857 (1996).

[2] *See* Promoting Spectrum Access for Wireless Microphone Operations; GN Docket No. 14–166 and Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, GN Docket 12.268 (FCC 14–145) *Notice of Proposed Rulemaking,* 29 FCC Rcd 12343, adopted September 30, 2014.

[3] *See* 5 U.S.C. 604.

operations without the need coordination where use would not cause harmful interference to TV service. We also open up the licensed use of the duplex gap to all entities eligible to hold LPAS licenses for using TV band spectrum. We also will require new wireless microphones operating in the TV bands and certain other bands to meet the more efficient analog and digital ETSI standards, which will ensure more efficient use of the spectrum. In addition, we address consumer education and outreach efforts that can help consumers transition out of the TV band spectrum that is repurposed for wireless services, and equipment certification procedures that will apply to wireless microphones in the future. We also discuss several additional actions we are taking with respect to other spectrum bands currently available for wireless microphone operations to enable greater use of these band to accommodate wireless microphone uses in the future. Specifically, we adopt revisions to provide new opportunities in the 169–172 MHz band and the 944–952 MHz band. Finally, we open up three other sets of spectrum bands—portions of the 941–944MHz and 952–960 MHz bands, the 1430–1525 MHz band, and the 6875–7125 MHz band—for sharing with licensed wireless microphone operations under specified conditions.

D. Summary of Significant Issues Raised by Public Comments in Response to the IFRA

111. There were no public comments filed that specifically addressed the rules and policies proposed in the IRFA.

E. Response to Comments by the Chief Counsel for Advocacy of the Small Business Administration

112. Pursuant to the Small Business Jobs Act of 2010, the Commission is required to respond to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration, and to provide a detailed statement of any change made to the proposed rules as a result of those comments. The Chief Counsel did not file any comments in response to the proposed rules in this proceeding.

F. Description and Estimate of the Number of Small Entities to Which the Final Rules Will Apply

113. The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.[4] The RFA generally defines the term ''small entity'' as having the same meaning as the terms ''small business,'' ''small organization,'' and ''small governmental jurisdiction.'' [5] In addition, the term ''small business'' has the same meaning as the term ''small business concern'' under the Small Business Act.[6] A small business concern is one which: (1) Is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.[7]

114. Small Businesses, Small Organizations, and Small Governmental Jurisdictions. Our action may, over time, affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three comprehensive, statutory small entity size standards.[8] First, nationwide, there are a total of 28.2 million small businesses, according to the SBA.[9] In addition, a ''small organization'' is generally ''any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.'' [10] Nationwide, as of 2012, there were approximately 2,300,000 small organizations.[11] Finally, the term ''small governmental jurisdiction'' is defined generally as ''governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.'' [12] Census Bureau data for 2012 indicate that there were 90,056 local governments in the United States.[13] Thus, we estimate that most governmental jurisdictions are small.

115. Low Power Auxiliary Station (LPAS) Licensees. Existing LPAS operations are intended for uses such as wireless microphones, cue and control communications, and synchronization of TV camera signals. These low power auxiliary stations transmit over distances of approximately 100 meters.[14] The appropriate LPAS size standard under SBA rules is for the category Wireless Telecommunications Carriers (except Satellite). The size standard for that category is that a business is small if it has 1,500 or fewer employees.[15] For this category, census data for 2007 show that there were 1,383 firms that operated for the entire year.[16] Of this total, 1,368 firms had employment of 999 or fewer employees and 15 had employment of 1000 employees or more.[17] Thus, using this data, we estimate that the majority of wireless firms can be considered small. There are a total of more than 1,200 Low Power Auxiliary Station (LPAS) licenses in all bands and a total of over 600 LPAS licenses in the UHF spectrum.[18]

116. *Low Power Auxiliary Device Manufacturers: Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing.* The Census Bureau defines this category as follows: ''This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are: Transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment.'' [19] The SBA has developed a small business size standard for Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing, which is: All such firms having 750 or fewer employees.[20] According to Census Bureau data for 2007, there were a total of 939 establishments in this category that

[4] 5 U.S.C. 603(b)(3).

[5] 5 U.S.C. 601(6).

[6] 5 U.S.C. 601(3) (incorporating by reference the definition of ''small business concern'' in 15 U.S.C. 632). Pursuant to the RFA, the statutory definition of a small business applies ''unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the **Federal Register**.'' 5 U.S.C. 601(3).

[7] Small Business Act, 15 U.S.C. 632 (1996).

[8] *See* 5 U.S.C. 601(3)–(6).

[9] *See* SBA, Office of Advocacy, ''Frequently Asked Questions,'' *http://www.sba.gov/sites/default/files/FAQ_March_2014_0.pdf* (last visited May 2, 2014; figures are from 2011).

[10] 5 U.S.C. 601(4).

[11] National Center for Charitable Statistics, The Nonprofit Almanac (2012).

[12] 5 U.S.C. 601(5).

[13] U.S. Census Bureau, Government Organization Summary Report: 2012 (rel. Sep. 26, 2013), *http://www2.census.gov/govs/cog/g12_org.pdf* (last visited May 2, 2014).

[14] 47 CFR 74.801.

[15] 13 CFR 121.201 (NAICS code 517210).

[16] U.S. Census Bureau, Table No. EC0751SSSZ5, *Information: Subject Series—Establishment and Firm Size: Employment Size of Firms for the United States: 2007* (NAICS code 517210), *http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_51SSSZ5*.

[17] *Id.* Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with 1000 employees or more.

[18] FCC, Universal Licensing System (ULS), *available at http://wireless.fcc.gov/uls/index.htm?job=home* (last visited May 13, 2014).

[19] U.S. Census Bureau, 2012 NAICS Definitions: 334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing, *http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=334220&search=2012* (last visited May 6, 2014).

[20] 13 CFR 121.201, NAICS code 334220.

operated for the entire year.[21] Of this total, 912 establishments had employment of less than 500, and an additional 10 establishments had employment of 500 to 999.[22] Thus, under this size standard, the majority of firms can be considered small.

117. *Low Power Auxiliary Device Manufacturers: Other Communications Equipment Manufacturing.* The Census Bureau defines this category as follows: ''This industry comprises establishments primarily engaged in manufacturing communications equipment (except telephone apparatus, and radio and television broadcast, and wireless communications equipment).'' [23] The SBA has developed a small business size standard for Other Communications Equipment Manufacturing, which is: All such firms having 750 or fewer employees.[24] According to Census Bureau data for 2007, there were a total of 452 establishments in this category that operated for the entire year.[25] Of this total, 448 establishments had employment below 500, and an additional 4 establishments had employment of 500 to 999.[26] Thus, under this size standard, the majority of firms can be considered small.

118. *Television Broadcasting.* This Economic Census category ''comprises establishments primarily engaged in broadcasting images together with sound. These establishments operate television broadcasting studios and facilities for the programming and transmission of programs to the public.'' [27] The SBA has created the following small business size standard for Television Broadcasting firms: Those having $38.5 million or less in annual receipts.[28] The Commission has estimated the number of licensed commercial television stations to be 1,388.[29] In addition, according to Commission staff review of the BIA Advisory Services, LLC's *Media Access Pro Television Database* on March 28, 2012, about 950 of an estimated 1,300 commercial television stations (or approximately 73 percent) had revenues of $14 million or less.[30] We therefore estimate that the majority of commercial television broadcasters are small entities.

119. We note, however, that in assessing whether a business concern qualifies as small under the above definition, business (control) affiliations must be included.[31] Our estimate, therefore, likely overstates the number of small entities that might be affected by our action because the revenue figure on which it is based does not include or aggregate revenues from affiliated companies. In addition, an element of the definition of ''small business'' is that the entity not be dominant in its field of operation. We are unable at this time to define or quantify the criteria that would establish whether a specific television station is dominant in its field of operation. Accordingly, the estimate of small businesses to which rules may apply does not exclude any television station from the definition of a small business on this basis and is therefore possibly over-inclusive to that extent.

120. In addition, the Commission has estimated the number of licensed noncommercial educational (NCE) television stations to be 396.[32] These stations are non-profit, and therefore considered to be small entities.[33]

121. There are also 2,414 low power television stations, including Class A stations and 4,046 television translator stations.[34] Given the nature of these services, we will presume that all of these entities qualify as small entities under the above SBA small business size standard.

122. *Cable Television Distribution Services.* Since 2007, these services have been defined within the broad economic census category of Wired Telecommunications Carriers; that category is defined as follows: ''This industry comprises establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies.'' [35] The SBA has developed a small business size standard for this category, which is: All such firms having 1,500 or fewer employees.[36] Census data for 2007 shows that there were 3,188 firms that operated for the duration of that year.[37] Of those, 3,144 had fewer than 1,000 employees, and 44 firms had more than 1,000 employees. Thus under this category and the associated small business size standard, the majority of such firms can be considered small.

123. *Cable Companies and Systems.* The Commission has also developed its own small business size standards, for the purpose of cable rate regulation. Under the Commission's rules, a ''small

[21] U.S. Census Bureau, Table No. EC0731SG3, Manufacturing: Summary Series: General Summary: Industry Statistics for Subsectors and Industries by Employment Size: 2007 (NAICS code 334220), *http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_31SG3*. The number of ''establishments'' is a less helpful indicator of small business prevalence in this context than would be the number of ''firms'' or ''companies,'' because the latter take into account the concept of common ownership or control. Any single physical location for an entity is an establishment, even though that location may be owned by a different establishment. Thus, the numbers given may reflect inflated numbers of businesses in this category, including the numbers of small businesses.

[22] *Id.* An additional 17 establishments had employment of 1,000 or more.

[23] U.S. Census Bureau, *2012 NAICS Definitions: 334290 Other Communications Equipment Manufacturing, http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=334290&search=2012* (last visited May 6, 2014).

[24] 13 CFR 121.201, NAICS code 334290.

[25] U.S. Census Bureau, Table No. EC0731SG3, Manufacturing: Summary Series: General Summary: Industry Statistics for Subsectors and Industries by Employment Size: 2007 (NAICS code 334290), *http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_31SG3&prodType=table* (last visited May 6, 2014). The number of ''establishments'' is a less helpful indicator of small business prevalence in this context than would be the number of ''firms'' or ''companies,'' because the latter take into account the concept of common ownership or control. Any single physical location for an entity is an establishment, even though that location may be owned by a different establishment. Thus, the numbers given may reflect inflated numbers of businesses in this category, including the numbers of small businesses.

[26] *Id.* There were no establishments that had employment of 1,000 or more.

[27] U.S. Census Bureau, *2012 NAICS Definitions: 515120 Television Broadcasting,* (partial definition), *http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=515120&search=2012* (last visited May 6, 2014).

[28] 13 CFR 121.201 (NAICS code 515120) (updated for inflation in 2010).

[29] *See FCC News Release,* Broadcast Station Totals as of December 31, 2013 (rel. January 8, 2014), *http://transition.fcc.gov/Daily_Releases/Daily_Business/2014/db0108/DOC-325039A1.pdf.*

[30] We recognize that BIA's estimate differs slightly from the FCC total given.

[31] ''[Business concerns] are affiliates of each other when one concern controls or has the power to control the other or a third party or parties controls or has to power to control both.'' 13 CFR 21.103(a)(1).

[32] *See FCC News Release,* Broadcast Station Totals as of December 31, 2013 (rel. January 8, 2014), *http://transition.fcc.gov/Daily_Releases/Daily_Business/2014/db0108/DOC-325039A1.pdf.*

[33] *See generally* 5 U.S.C. 601(4), (6).

[34] *See FCC News Release,* Broadcast Station Totals as of December 31, 2013 (rel. January 8, 2014), *http://transition.fcc.gov/Daily_Releases/Daily_Business/2014/db0108/DOC-325039A1.pdf.*

[35] U.S. Census Bureau, *2012 NAICS Definitions: 517110 Wired Telecommunications Carriers, http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517110&search=2012* (last visited May 5, 2014).

[36] U.S. Small Business Administration, Table of Small Business Size Standards Matched to North American Industry Classification System Codes, at 28 (2014), *http://www.sba.gov/sites/default/files/files/size_table_01222014.pdf.*

[37] *See* U.S. Census Bureau, American FactFinder, 2007 Economic Census of the United States, Table No. EC0751SSSZ5, Establishment and Firm Size: Employment Size of Firms for the United States: 2007, NAICS code 517110, *http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_51SSSZ5 (last visited May 7, 2014).*

cable company'' is one serving 400,000 or fewer subscribers, nationwide.[38] Industry data indicate that of approximately 1,100 cable operators nationwide, all but ten are small under this size standard.[39] In addition, under the Commission's rules, a ''small system'' is a cable system serving 15,000 or fewer subscribers.[40] Current Commission records show 4,945 cable systems nationwide.[41] Of this total, 4,380 cable systems have fewer than 20,000 subscribers, and 565 systems have 20,000 or more subscribers, based on the same records. Thus, under this standard, we estimate that most cable systems are small entities.

124. *Cable System Operators.* The Communications Act of 1934, as amended, also contains a size standard for small cable system operators, which is ''a cable operator that, directly or through an affiliate, serves in the aggregate fewer than 1 percent of all subscribers in the United States and is not affiliated with any entity or entities whose gross annual revenues in the aggregate exceed $250,000,000.'' [42] The Commission has determined that an operator serving fewer than 677,000 subscribers shall be deemed a small operator, if its annual revenues, when combined with the total annual revenues of all its affiliates, do not exceed $250 million in the aggregate.[43] Industry data indicate that of approximately 1,100 cable operators nationwide, all but ten are small under this size standard.[44] We note that the Commission neither requests nor collects information on whether cable system operators are affiliated with entities whose gross annual revenues exceed $250 million,[45] and therefore we are unable to estimate more accurately the number of cable system operators that would qualify as small under this size standard.

125. *Direct Broadcast Satellite (''DBS'') Service.* DBS service is a nationally distributed subscription service that delivers video and audio programming via satellite to a small parabolic ''dish'' antenna at the subscriber's location. DBS, by exception, is now included in the SBA's broad economic census category, Wired Telecommunications Carriers,[46] which was developed for small wireline firms. Under this category, the SBA deems a wireline business to be small if it has 1,500 or fewer employees.[47] To gauge small business prevalence for the DBS service, the Commission relies on data currently available from the U.S. Census for the year 2007. According to that source, there were 3,188 firms that in 2007 were Wired Telecommunications Carriers. Of these, 3,144 operated with less than 1,000 employees, and 44 operated with more than 1,000 employees. However, as to the latter 44 there is no data available that shows how many operated with more than 1,500 employees. Based on this data, the majority of these firms can be considered small.[48] Currently, only two entities provide DBS service, which requires a great investment of capital for operation: DIRECTV and EchoStar Communications Corporation (''EchoStar'') (marketed as the DISH Network).[49] Each currently offers subscription services. DIRECTV [50] and EchoStar [51] each report annual revenues that are in excess of the threshold for a small business. Because DBS service requires significant capital, we believe it is unlikely that a small entity as defined by the SBA would have the financial wherewithal to become a DBS service provider.

126. *Cable and Other Subscription Programming.* This industry comprises establishments primarily engaged in operating studios and facilities for the broadcasting of programs on a subscription or fee basis. The broadcast programming is typically narrowcast in nature (*e.g.,* limited format, such as news, sports, education, or youth-oriented). These establishments produce programming in their own facilities or acquire programming. The programming material is usually delivered to a third party, such as cable systems or direct-to-home satellite systems, for transmission to viewers.[52] The SBA size standard for this industry establishes as small any company in this category which receives annual receipts of $38.5 million or less.[53] Based on U.S. Census data for 2007, a total of 659 establishments operated for the entire year.[54] Of that 659, 197 operated with annual receipts of $10 million or more. The remaining 462 establishments operated with annual receipts of less than $10 million. Based on this data, the Commission estimates that the majority of establishments operating in this industry are small.

127. *Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing.* The Census Bureau defines this category as follows: ''This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are: Transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting

[38] 47 CFR 76.901(e). The Commission determined that this size standard equates approximately to a size standard of $100 million or less in annual revenues. Implementation of Sections of the 1992 Cable Act: Rate Regulation, *Sixth Report and Order and Eleventh Order on Reconsideration,* 10 FCC Rcd 7393, 7408 (1995).

[39] Industry Data, National Cable & Telecommunications Association, *https://www.ncta.com/industry-data* (last visited May 6, 2014); R.R. Bowker, *Broadcasting & Cable Yearbook 2010,* ''Top 25 Cable/Satellite Operators,'' p. C–2 (data current as of December, 2008).

[40] 47 CFR 76.901(c).

[41] The number of active, registered cable systems comes from the Commission's Cable Operations and Licensing System (COALS) database on Aug. 28, 2013. A cable system is a physical system integrated to a principal headend.

[42] 47 U.S.C. 543(m)(2); *see* 47 CFR 76.901(f) & nn. 1–3.

[43] 47 CFR 76.901(f); *see* Public Notice, *FCC Announces New Subscriber Count for the Definition of Small Cable Operator,* DA 01–158 (Cable Services Bureau, Jan. 24, 2001).

[44] R.R. Bowker, *Broadcasting & Cable Yearbook 2006,* ''Top 25 Cable/Satellite Operators,'' pages A–8 & C–2 (data current as of June 30, 2005); Warren Communications News, *Television & Cable Factbook 2006,* ''Ownership of Cable Systems in the United States,'' pp. D–1805 to D–1857.

[45] The Commission does receive such information on a case-by-case basis if a cable operator appeals a local franchise authority's finding that the operator does not qualify as a small cable operator pursuant to 76.901(f) of the Commission's rules. See 47 CFR 76.909(b).

[46] *See* 13 CFR 121.201 (NAICS code 517110).

[47] *Id.*

[48] *See* U.S. Census Bureau, Table No. EC0751SSSZ5, *Information: Subject Series—Establishment and Firm Size: Employment Size of Firms for the United States: 2007* (NAICS code 517110), *http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_51SSSZ5.*

[49] *See Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming,* Fifteenth Annual Report, MB Docket No. 12–203, 28 FCC Rcd 10496, 10507, para. 27 (2013) (''*15th Annual Report''*).

[50] As of June 2012, DIRECTV is the largest DBS operator and the second largest MVPD, serving an estimated 19.8% of MVPD subscribers nationwide. *See 15th Annual Report,* 28 FCC Rcd at 687, Table B–3.

[51] As of June 2012, DISH Network is the second largest DBS operator and the third largest MVPD, serving an estimated 13.01% of MVPD subscribers nationwide. *Id.* As of June 2006, Dominion served fewer than 500,000 subscribers, which may now be receiving ''Sky Angel'' service from DISH Network. See id. at 581, para. 76.

[52] U.S. Census Bureau, 2012 NAICS Definitions: 515210 Cable and Other Subscription Programming, *http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=515210&search=2012* (last visited Mar. 6, 2014).

[53] See 13 CF R section 121.201 (NAICS code 515210).

[54] See U.S. Census Bureau, Table No. EC0751SSSZ1, Information: Subject Series—Establishment and Firm Size: Receipts Size of Establishments for the United States: 2007 (NAICS code 515210), *http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_51SSSZ1.*

equipment.'' [55] The SBA has developed a small business size standard for Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing, which is: All such firms having 750 or fewer employees.[56] According to Census Bureau data for 2007, there were a total of 939 establishments in this category that operated for part or all of the entire year. Of this total, 912 had less than 500 employees and 17 had more than 1000 employees.[57] Thus, under that size standard, the majority of firms can be considered small.

128. *Audio and Video Equipment Manufacturing.* The SBA has classified the manufacturing of audio and video equipment under in NAICS Codes classification scheme as an industry in which a manufacturer is small if it has fewer than 750 employees.[58] Data contained in the 2007 U.S. Census indicate that 492 establishments operated in that industry for all or part of that year. In that year, 488 establishments had fewer than 500 employees; and only 1 had more than 1000 employees.[59] Thus, under the applicable size standard, a majority of manufacturers of audio and video equipment may be considered small.

129. *Wireless Telecommunications Carriers (except satellite).* The Census Bureau defines this category as follows: ''This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular phone services, paging services, wireless Internet access, and wireless video services.'' [60] The appropriate size standard under SBA rules is for the category Wireless Telecommunications Carriers (except Satellite). The size standard for that category is that a business is small if it has 1,500 or fewer employees.[61] For this category, census data for 2007 show that there were 1,383 firms that operated for the entire year.[62] Of this total, 1,368 firms had employment of 999 or fewer employees and 15 had employment of 1000 employees or more.[63] Similarly, according to Commission data, 413 carriers reported that they were engaged in the provision of wireless telephony, including cellular service, PCS, and Specialized Mobile Radio (''SMR'') Telephony services.[64] Of these, an estimated 261 have 1,500 or fewer employees and 152 have more than 1,500 employees.[65] Consequently, the Commission estimates that approximately half or more of these firms can be considered small. Thus, using available data, we estimate that the majority of wireless firms can be considered small.

130. *Manufacturers of unlicensed devices.* In the context of this FRFA, manufacturers of part 15 unlicensed devices that are operated in the UHF–TV band (channels 14–51) for wireless data transfer fall into the category of Radio and Television and Wireless Communications Equipment Manufacturing. The Census Bureau defines this category as follows: ''This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are: Transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment.'' [66] The SBA has developed the small business size standard for this category as firms having 750 or fewer employees.[67] According to Census Bureau data for 2007, there were a total of 939 establishments in this category that operated for the entire year.[68] Of this total, 912 had less than 500 employees and 17 had more than 1000 employees. Thus, under that size standard, the majority of firms can be considered small.

131. *Personal Radio Services/Wireless Medical Telemetry Service (''WMTS'').* Personal radio services provide short-range, low power radio for personal communications, radio signaling, and business communications not provided for in other services. The Personal Radio Services include spectrum licensed under part 95 of our rules.[69] These services include Citizen Band Radio Service (''CB''), General Mobile Radio Service (''GMRS''), Radio Control Radio Service (''R/C''), Family Radio Service (''FRS''), Wireless Medical Telemetry Service (''WMTS''), Medical Implant Communications Service (''MICS''), Low Power Radio Service (''LPRS''), and Multi-Use Radio Service (''MURS'').[70] There are a variety of methods used to license the spectrum in these rule parts, from licensing by rule, to conditioning operation on successful completion of a required test, to site-based licensing, to geographic area licensing. Under the RFA, the Commission is required to make a determination of which small entities are directly affected by the rules adopted. Since all such entities are wireless, we apply the definition of Wireless Telecommunications Carriers (except Satellite), pursuant to which a small entity is defined as employing 1,500 or fewer persons.[71] For this category, census data for 2007 show that there were 1,383 firms that operated for the entire year.[72] Of this total, 1,368 firms had employment of 999 or fewer

[55] U.S. Census Bureau, 2012 NAICS Definitions: 334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing, *http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=334220&search=2012* (last visited Mar. 6, 2014).

[56] 13 CFR 121.201 (NAICS code 334220).

[57] *See* U.S. Census Bureau, Table No. EC0731SG3, *Manufacturing: Summary Series: General Summary: Industry Statistics for Subsectors and Industries by Employment Size: 2007* (NAICS code 334220), *http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_31SG3.*

[58] 13 CFR 121.201 (NAICS code 334310).

[59] *See* U.S. Census Bureau, Table No. EC0731SG3, *Manufacturing: Summary Series: General Summary: Industry Statistics for Subsectors and Industries by Employment Size: 2007* (NAICS code 334310), *http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_31SG3.*

[60] U.S. Census Bureau, *2012 NAICS Definitions: 517210 Wireless Telecommunications Carriers (except Satellite), http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517210&search=2012* (last visited Mar. 6, 2014).

[61] 13 CFR 121.201 (NAICS code 517210).

[62] U.S. Census Bureau, Table No. EC0751SSSZ5, *Information: Subject Series—Establishment and Firm Size: Employment Size of Firms for the United States: 2007* (NAICS code 517210), *http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_51SSSZ5.*

[63] *Id.* Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with 1000 employees or more.

[64] *See Trends in Telephone Service* at Table 5.3.

[65] *See id.*

[66] U.S. Census Bureau, *2012 NAICS Definitions: 334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing, http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=334220&search=2012* (last visited Mar. 6, 2014).

[67] 13 CFR 121.201 (NAICS code 334220).

[68] U.S. Census Bureau, Table No. EC0731SG3, *Manufacturing: Summary Series: General Summary: Industry Statistics for Subsectors and Industries by Employment Size: 2007* (NAICS code 334220), *http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_31SG3.*

[69] 47 CFR part 95.

[70] The Citizens Band Radio Service, General Mobile Radio Service, Radio Control Radio Service, Family Radio Service, Wireless Medical Telemetry Service, Medical Implant Communications Service, Low Power Radio Service, and Multi-Use Radio Service are governed by subpart D, subpart A, subpart C, subpart B, subpart H, subpart I, subpart G, and subpart J, respectively, of part 95 of the Commission's rules. *See generally* 47 CFR part 95.

[71] 13 CFR 121.201 (NAICS Code 517210).

[72] U.S. Census Bureau, Table No. EC0751SSSZ5, *Information: Subject Series—Establishment and Firm Size: Employment Size of Firms for the United States: 2007* (NAICS code 517210), *http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_51SSSZ5.*

employees and 15 had employment of 1000 employees or more.[73] Thus under this category and the associated small business size standard, the Commission estimates that the majority of personal radio service and WMTS providers are small entities.

132. However, we note that many of the licensees in these services are individuals, and thus are not small entities. In addition, due to the mostly unlicensed and shared nature of the spectrum utilized in many of these services, the Commission lacks direct information upon which to base a more specific estimation of the number of small entities under an SBA definition that might be directly affected by our action.

133. *Motion Picture and Video Production.* The Census Bureau defines this category as follows: ''This industry comprises establishments primarily engaged in producing, or producing and distributing motion pictures, videos, television programs, or television commercials.'' [74] The SBA has developed a small business size standard for this category, which is: All such businesses having $30 million dollars or less in annual receipts.[75] Census data for 2007 show that there were 9,478 establishments that operated that year.[76] Of that number, 9,128 had annual receipts of $24,999,999 or less, and 350 had annual receipts ranging from not less than $25,000,000 to $100,000,000 or more.[77] Thus, under this size standard, the majority of such businesses can be considered small entities.

134. *Radio Broadcasting.* The SBA defines a radio broadcast station as a small business if such station has no more than $38.5 million in annual receipts.[78] Business concerns included in this industry are those ''primarily engaged in broadcasting aural programs by radio to the public.'' [79] According to review of the BIA Publications, Inc. Master Access Radio Analyzer Database as of November 26, 2013, about 11,331 (or about 99.9 percent) of 11,341 commercial radio stations have revenues of $35.5 million or less and thus qualify as small entities under the SBA definition. The Commission notes, however, that, in assessing whether a business concern qualifies as small under the above definition, business (control) affiliations [80] must be included. This estimate, therefore, likely overstates the number of small entities that might be affected, because the revenue figure on which it is based does not include or aggregate revenues from affiliated companies.

135. In addition, an element of the definition of ''small business'' is that the entity not be dominant in its field of operation. The Commission is unable at this time to define or quantify the criteria that would establish whether a specific radio station is dominant in its field of operation. Accordingly, the estimate of small businesses to which rules may apply does not exclude any radio station from the definition of a small business on this basis and therefore may be over-inclusive to that extent. Also, as noted, an additional element of the definition of ''small business'' is that the entity must be independently owned and operated. The Commission notes that it is difficult at times to assess these criteria in the context of media entities and the estimates of small businesses to which they apply may be over-inclusive to this extent.

136. *Radio, Television, and Other Electronics Stores.* The Census Bureau defines this economic census category as follows: ''This U.S. industry comprises: (1) establishments known as consumer electronics stores primarily engaged in retailing a general line of new consumer-type electronic products such as televisions, computers, and cameras; (2) establishments specializing in retailing a single line of consumer-type electronic products; (3) establishments primarily engaged in retailing these new electronic products in combination with repair and support services; (4) establishments primarily engaged in retailing new prepackaged computer software; and/or (5) establishments primarily engaged in retailing prerecorded audio and video media, such as CDs, DVDs, and tapes.'' [81] The SBA has developed a small business size standard for Electronic Stores, which is: All such firms having $32.5 million or less in annual receipts.[82] According to Census Bureau data for 2007, there were 11,358 firms in this category that operated for the entire year.[83] Of this total, 11,323 firms had annual receipts of under $25 million, and 35 firms had receipts of $25 million or more but less than $50 million.[84] Thus, the majority of firms in this category can be considered small.

G. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities

137. In this proceeding, we invited comment on potential revisions to the existing rules for part 74 wireless microphone (and other LPAS) operations in the spectrum that will remain allocated for TV services following the repacking process. Specifically, we invited comment on revisions to the technical rules for LPAS operations on the VHF band; on permitting licensed LPAS operations on channels in locations closer to the television stations (including within the DTV contour), without the need for coordination, provided that the television signal falls below specified technical thresholds; on adoption of the ETSI emission mask standard for analog and digital wireless microphones; and general comment on other potential revisions concerning licensed LPAS operations in the TV bands.

138. We understand the importance of the 944–952 MHz band for broadcasters as well as other licensed, professional wireless microphone users. Consistent with this record and in accord with adoption of the ETSI standard for LPAS devices in the TV bands. we also adopt the ETSI standards EN 300 422–1, section 8.3.1.2 for analog emissions and section 8.3.2.2 for digital emissions uniformly for future wireless microphones that will use this band—applying these revised standards to new

[73] *Id.* Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with 1000 employees or more.

[74] U.S. Census Bureau, *2012 NAICS Definitions: 512110 Motion Picture and Video Production, http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=512110&search=2012* (last visited Mar. 6, 2014).

[75] 13 CFR 121.201, 2012 NAICS code 512110.

[76] U.S. Census Bureau, Table No. EC0751SSSZ5, *Information: Subject Series—Establishment and Firm Size: Employment Size of Firms for the United States: 2007* (NAICS code 512110), *http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_51SSSZ5.*

[77] *See id.*

[78] 13 CFR 121.201, 2012 NAICS code 515112.

[79] U.S. Census Bureau, *2012 NAICS Definitions: 515112 Radio Broadcasting, http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=515112&search=2012* (last visited Mar. 6, 2014).

[80] *See* n.14.

[81] U.S. Census Bureau, *2012 NAICS Definitions, 443142 Electronics, http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=443142&search=2012* NAICS Search (last visited May 6, 2014).

[82] 13 CFR 121.201, NAICS code 443142.

[83] U.S. Census Bureau, 2007 Economic Census, Subject Series: Retail Trade, Estab & Firm Size: Summary Statistics by Sales Size of Firms for the United States: 2007, NAICS code 443142 (released 2010), *http://www2.census.gov/econ2007/EC/sector44/EC0744SSSZ4.zip* (last visited May 7, 2014). Though the current small business size standard for electronic store receipts is $30 million or less in annual receipts, in 2007 the small business size standard was $9 million or less in annual receipts. In 2007, there were 11,214 firms in this category that operated for the entire year. Of this total, 10,963 firms had annual receipts of under $5 million, and 251 firms had receipts of $5 million or more but less than $10 million. *Id.*

[84] *Id.* An additional 33 firms had annual receipts of $50 million or more.

equipment certified under part 74 in the 944–952 MHz band 9 months after issuance of the *Channel Reassignment PN,* consistent with the requirements for new equipment certified for LPAS devices that operate in the TV bands. Further, we expand eligibility for operations in the 944–952 MHz band to include all entities currently eligible to hold LPAS licenses for operation in the TV bands, which should help address the need for additional spectrum outside of the TV bands for this entire group of licensed users.

139. Licensed LPAS users operating in the 944–952 MHz band (as in the TV bands) are subject to the frequency selection requirements contained in section 74.803 of our rules.[85] SBE runs a local frequency coordination program for this band and asserts its coordination would have to be mandatory in order to avoid interference among different licensees.[86] Accordingly, we will also require wireless microphone users seeking access to this band to coordinate their proposed use through the local SBE coordinator.[87]

140. *Consumer Outreach.* We find that several means should be employed to provide as much notice as possible to users of the need to clear the 600 MHz Band of wireless microphones. We direct CGB, working with WTB and OET, to establish a Web page on the Commission's Web site, and prepare and release consumer publications, including a Consumer Fact Sheet and answers to Frequently Asked Questions (FAQs), that inform the public of our decisions affecting wireless microphone operations in the repurposed 600 MHz Band and the guard bands, as set forth in the *Incentive Auction R&O,* this R&O, and the *Part 15 Report and Order.*[88] We further direct Commission staff to identify and contact organizations that represent entities that are known to be users of wireless microphones in the 600 MHz Band, including groups that represent theaters, houses of worship, and sporting venues. We will inform these entities of our decisions affecting wireless microphone operations in the repurposed spectrum and available resources for information on options for wireless microphone use going forward.

141. Further, we expect all manufacturers of wireless microphones to make significant efforts to ensure that all users of such equipment capable of operating in the 600 MHz Band are fully informed of the decisions affecting them, as set forth in the *Incentive Auction R&O,* this Report and Order, and the *Part 15 Report and Order.* Specifically, we expect these manufacturers, at a minimum, to ensure that these users are informed of the need to clear the 600 MHz Band. Manufacturers also should inform users of wireless microphones that they may continue to operate in the 600 MHz Band until the end of the post-auction transition period, but only subject to the conditions set forth in these orders, including the early clearing mechanisms. Further, we expect all manufacturers to contact dealers, distributors, and anyone else who has purchased wireless microphones, and inform them of our decisions to help clear the 600 MHz Band. Manufacturers should also provide information on these decisions to any users that have filed warranty registrations for 600 MHz Band equipment with the manufacturer. We also expect manufacturers to post this information on their Web sites and include it in all of their sales literature.

142. In addition, we urge all manufacturers to offer rebates and trade-in programs for any 600 MHz Band wireless microphones, and widely publicize these programs to ensure that all users of wireless microphones are fully informed. To the extent manufacturers do not offer a rebate or trade-in program for 600 MHz Band wireless microphones, we strongly encourage them to create or re-establish such programs. In contacting dealers and distributors, we expect manufacturers to inform these entities that they should: (1) Inform all customers who have purchased wireless microphones that are capable of operating in the 600 MHz Band of our decision to clear the 600 MHz Band of such devices; (2) post such information on their Web sites; (3) include this information in all other sales literature; (4) provide information in sales literature, including on their Web sites, on the availability of any manufacturer rebate offerings and trade-in programs related to wireless microphones operating in the 600 MHz Band; and (5) comply with the disclosure requirements that we are adopting in this Report and Order.

143. *Disclosure Requirement.* We require anyone selling, leasing, or offering for sale or lease wireless microphones that operate in the 600 MHz Band to provide certain written disclosures to consumers, pursuant to section 302. These entities must display the Consumer Disclosure, the text of which will be developed by Commission staff, at the point of sale or lease,[89] in a clear, conspicuous, and readily legible manner. In addition, the Consumer Disclosure must be displayed on the Web site of the manufacturer (even in the event the manufacturer does not sell wireless microphones directly to the public) and of dealers, distributors, retailers, and anyone else selling or leasing the devices. We delegate authority to the Consumer and Governmental Affairs Bureau, working with the Wireless Telecommunications Bureau and the Office of Engineering and Technology, to prepare the specific language, following issuance of the *Channel Reassignment PN,* that must be used in the Consumer Disclosure and publish it in the **Federal Register**. As discussed above, there is more than one way in which the point-of-sale Consumer Disclosure may be provided to potential purchasers or lessees of wireless microphones, but each of them must satisfy all the requirements noted above, including that the disclosure be provided in writing at the point of sale in a clear, conspicuous, and readily legible manner. One way to fulfill this disclosure requirement would be to display the Consumer Disclosure in a prominent manner on the product box by using a label (either printed onto the box or otherwise affixed to the box), a sticker, or other means. Another way to fulfill the disclosure requirement would be to display the text immediately adjacent to each wireless microphone offered for sale or lease and clearly associated with the model to which it pertains. For wireless microphones offered online or via direct mail or catalog, the disclosure must be prominently displayed in close proximity to the images and descriptions of each wireless microphone. We will require manufacturers, dealers, distributors, and other entities that sell or lease wireless microphones for operation in the 600 MHz Band to comply with the disclosure requirements no later than three months following issuance of the *Channel Reassignment PN,* and we encourage these entities to provide consumers with the required information earlier.[90]

[85] *See* 47 CFR 74.803.

[86] SBE Comments at 13.

[87] These processes are described on SBE's Web site. *See* The Society of Broadcast Engineers, Frequency Coordination, *http://www.sbe.org/sections/freq_local.php.*

[88] See part 15 Report and Order, section [__] (discussing requirements relating to unlicensed wireless microphones).

[89] By ''point of sale or lease'' we mean the place or Web site where wireless microphones are displayed or offered for consumers to purchase or lease.

[90] This disclosure requirement requires approval from the Office of Management and Budget (OMB) as a new information collection under the Paperwork Reduction Act (PRA). We anticipate approval of the requirement shortly following publication of a summary of this Report and Order

E. Steps Taken To Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

144. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.[91]

145. The rule revisions that we are adopting provide additional opportunities for licensed wireless microphone users, both in frequency bands in which they currently operate and in additional frequency bands. The majority of these changes are permissive, meaning that wireless microphone manufacturers may choose to incorporate new capabilities in future devices. We adopt rules to establish cutoff dates for the certification, manufacturing and marketing of licensed wireless microphones in the 600 MHz band repurposed for wireless services following the incentive auction. We will no longer accept applications to certify licensed wireless microphones that operate in the 600 MHz band nine months after the release of the *Channel Reassignment PN* or no later than 24 months after the effective date of the new rules, whichever occurs first. We will require that manufacturing and marketing of all licensed wireless microphones that would not comply with the 600 MHz Band cease 18 months after release of the *Channel Reassignment PN* or no later than 33 months after the effective date of the new rules, whichever occurs first.

Report to Congress: The Commission will send a copy of the Report and Order, including this FRFA, in a report to Congress pursuant to the Congressional Review Act.[92] In addition, the Commission will send a copy of the Report and Order, including this FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of the Report and Order and FRFA (or summaries thereof) will also be published in the **Federal Register**.[93]

146. The Office of Federal Register (OFR) recently revised the regulations to require that agencies must discuss in the preamble of the rule ways that the materials the agency incorporates by reference are reasonably available to interested persons and how interested parties can obtain the materials. In addition, the preamble of the rule must summarize the material. 1 CFR 51.5(b). In accordance with OFR's requirements, the discussion in this section summarizes ETSI standard. The following document is available from the European Telecommunications Standards Institute, 650 Route des Lucioles, F–06921 Sophia Antipolis Cedex, France, or at *http://www.etsi.org/deliver/etsi_en/3004000_300499/30042201/01.04.02_60/en_30042201v01010402p.pdf.* ''ETSI EN 300 422–1 V1.4.2 (2011–08): Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement, August 2011, IBR approved for section 15.236(g).'' This standard requires wireless microphones to meet certain emission requirements which will protect authorized services in adjacent bands from harmful interference, and will improve spectrum sharing by wireless microphones.

Congressional Review Act: The Commission will send a copy of this Report and Order to Congress and the Government Accountability Office pursuant to the Congressional Review Act, *see* 5 U.S.C. 801(a)(1)(A).

IV. Ordering Clauses

147. Pursuant to sections 1, 4(i), 4(j), 7(a), 301, 302, 303(f), 303(g), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. 151, 154(i), 154(j), 157(a), 301, 302a, 303(f), 303(g), and 303(r), this Report and Order *is adopted.*

148. Parts 2, 15, 74, 87, and 90 of the Commission's rules, 47 CFR parts 2, 15, 74, 87, and 90, ARE AMENDED as set forth in the final rules.

149. The rules adopted herein *will become effective* December 17, 2015, except for sections 15.37(k) and 74.851(l), which contain new or modified information collection requirements that require approval by the OMB under the PRA, which *will become effective* after the Commission publishes a notice in the **Federal Register** announcing such approval and the relevant effective date.

150. The Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, *shall send* a copy of this Report and Order, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

151. Pursuant to section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), and section 1.925 of the Commission's rules, 47 CFR 1.925, that the waiver request filed on July 16, 2009 and revised on September 23, 2009 by the Nuclear Energy Institute and the United Telecom Council for waiver of parts 2 and 90 of the Commission's *rules IS DISMISSED AS MOOT IN PART* as set forth in the Order *and otherwise denied.*

152. Pursuant to section 5(c) of the Communications Act of 1934, as amended, 47 U.S.C. prepare the specific language that must be used in the Consumer Disclosure, as set forth in this Report 47

List of Subjects

47 CFR Part 2

Communication equipment and Reporting and recordkeeping requirements.

47 CFR Part 15

Communications equipment, Incorporation by reference, and Reporting and recordkeeping requirements.

47 CFR Part 74

Communication equipment, Education, Incorporation by reference, and Report and recordkeeping requirements.

47 CFR Part 87

Commination equipment and Reporting and recordkeeping requirements.

47 CFR Part 90

Communication equipment, Incorporation by reference, Reporting and recordkeeping requirements.

Federal Communications Commission.

Marlene H. Dortch,

Secretary.

Final Rules

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR parts 2, 15, 74, 87, and 90 as follows:

PART 2—FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

■ 1. The authority citation for part 2 continues to read as follows:

in the **Federal Register**, sufficiently in advance of the date by which the disclosure requirement goes into effect.

[91] *See* 5 U.S.C. 603(c).

[92] *See* 5 U.S.C. 801(a)(1)(A).

[93] *See* 5 U.S.C. 604(b).

Authority: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

■ 2. Section 2.106, the Table of Frequency Allocations, is amended as follows:

■ a. Page 33 is revised.

■ b. In the list of United States (US) Footnotes, footnote US84 is added.

§ 2.106 Table of Frequency Allocations.

The revision and addition read as follows:

* * * * *

BILLING CODE 6712–01–P

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
1400-1427 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341			1400-1427 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive) 5.341 US246		
1427-1429 SPACE OPERATION (Earth-to-space) FIXED MOBILE except aeronautical mobile 5.338A 5.341			1427-1429.5 LAND MOBILE (medical telemetry and medical telecommand) US350 5.341 US79	1427-1429.5 LAND MOBILE (telemetry and telecommand) Fixed (telemetry) 5.341 US79 US350 NG338A	Private Land Mobile (90) Personal Radio (95)
1429-1452 FIXED MOBILE except aeronautical mobile	1429-1452 FIXED MOBILE 5.343		1429.5-1432 5.341 US79 US350	1429.5-1432 FIXED (telemetry and telecommand) LAND MOBILE (telemetry and telecommand) 5.341 US79 US350 NG338A	
			1432-1435 5.341 US83	1432-1435 FIXED MOBILE except aeronautical mobile 5.341 US83 NG338A	Wireless Communications (27)
5.338A 5.341 5.342	5.338A 5.341		1435-1525 MOBILE (aeronautical telemetry) US338A		
1452-1492 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.208B 5.341 5.342 5.345	1452-1492 FIXED MOBILE 5.343 BROADCASTING BROADCASTING-SATELLITE 5.208B 5.341 5.344 5.345				Low Power Auxiliary (74H) Aviation (87)
1492-1518 FIXED MOBILE except aeronautical mobile 5.341 5.342	1492-1518 FIXED MOBILE 5.343 5.341 5.344	1492-1518 FIXED MOBILE 5.341			
1518-1525 FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.351A 5.341 5.342	1518-1525 FIXED MOBILE 5.343 MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.351A 5.341 5.344	1518-1525 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.351A 5.341	5.341 US84 US343		

BILLING CODE 6712–01–C

United States (US) Footnotes

* * * * *

US84 In the band 1435–1525 MHz, low power auxiliary stations may be authorized on a secondary basis, subject to the terms and conditions set forth in 47 CFR part 74, subpart H.

* * * * *

PART 15—RADIO FREQUENCY DEVICES

■ 3. The authority citation for part 15 continues to read as follows:

Authority: 47 U.S.C. 154, 302, 303, 304, 307, 336, 554a and 549.

■ 4. Section 15.37 is amended by adding reserved paragraphs (i) and (j) and adding paragraph (k) to read as follows:

§ 15.37 Transition provisions for compliance with the rules.

* * * * *

(i) [Reserved]

(j) [Reserved]

(k) *Disclosure requirements for unlicensed wireless microphones capable of operating in the 600 MHz service band.* Any person who manufactures, sells, leases, or offers for sale or lease, unlicensed wireless microphones that are capable of operating in the 600 MHz service band, as defined in this part, three months following issuance of the Channel Reassignment Public Notice, as defined in section 73.3700(a)(2) of this chapter, is subject to the following disclosure requirements:

(1) Such persons must display the consumer disclosure text, as specified by the Consumer and Governmental Affairs Bureau, at the point of sale or lease of each such unlicensed wireless microphone. The text must be displayed in a clear, conspicuous, and readily legible manner. One way to fulfill the requirement in this section is to display the consumer disclosure text in a prominent manner on the product box by using a label (either printed onto the box or otherwise affixed to the box), a sticker, or other means. Another way to fulfill this requirement is to display the text immediately adjacent to each unlicensed wireless microphone offered for sale or lease and clearly associated with the model to which it pertains.

(2) If such persons offer such unlicensed wireless microphones via direct mail, catalog, or electronic means, they shall prominently display the consumer disclosure text in close proximity to the images and descriptions of each such unlicensed wireless microphone. The text should be in a size large enough to be clear, conspicuous, and readily legible, consistent with the dimensions of the advertisement or description.

(3) If such persons have Web sites pertaining to these unlicensed wireless microphones, the consumer disclosure text must be displayed there in a clear, conspicuous, and readily legible manner (even in the event such persons do not sell unlicensed wireless microphones directly to the public).

(4) The consumer disclosure text described in paragraph (k)(1) of this section is set forth as an appendix to this section.

* * * * *

§ 15.216 [Removed and Reserved]

■ 5. Section 15.216 is removed and reserved.

PART 74—EXPERIMENTAL RADIO, AUXILIARY, SPECIAL BROADCAST AND OTHER PROGRAM DISTRIBUTION SERVICES

■ 6. The authority citation for part 74 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, 307, 309, 336, and 554.

■ 7. Section 74.801 is amended by adding in alphabetical order definitions for ''600 MHz duplex gap,'' . ''600 MHz guard bands,'' ''600 MHz service band,'' *and* ''Spectrum Act'' *to read as follows:*

§ 74.801 Definitions

600 MHz duplex gap. An 11 megahertz guard band that separates part 27 600 MHz service uplink and downlink frequencies, in accordance with the terms and conditions established in GN Docket No. 12–268, pursuant to section 6403 of the Spectrum Act.

600 MHz guard bands. Designated frequency bands that prevent interference between licensed services in the 600 MHz service band and either the television bands or channel 37, in accordance with the terms and conditions established in GN Docket No. 12–268, pursuant to section 6403 of the Spectrum Act.

600 MHz service band. Frequencies that will be reallocated and reassigned for 600 MHz band services as determined by the outcome of the auction conducted pursuant to part 27, in accordance with the terms and conditions established in GN Docket No. 12–268, pursuant to section 6403 of the Spectrum Act

Note to definitions of *600 MHz duplex gap, 600 MHz guard bands,* and *600 MHz service band:* The specific frequencies will be determined in light of further proceedings pursuant to GN Docket No. 12–268 and the rules will be updated accordingly pursuant to a future public notice.

* * * * *

Spectrum Act. Title VI of the Middle Class Tax Relief and Job Creation Act of 2012 (Pub. L. 112–96).

* * * * *

■ 8. Section 74.802 is amended by revising paragraphs (a) and (b)(2) to read as follows:

§ 74.802 Frequency assignment.

(a)(1) Frequencies within the following bands may be assigned for use by low power auxiliary stations:

26.100–26.480 MHz
54.000–72.000 MHz
76.000–88.000 MHz
161.625–161.775 MHz (except in Puerto Rico or the Virgin Islands)
174.000–216.000 MHz
450.000–451.000 MHz
455.000–456.000 MHz
470.000–488.000 MHz
488.000–494.000 MHz (except Hawaii)
494.000–608.000 MHz
614.000–698.000 MHz
941.500–952.000 MHz
952.850–956.250 MHz
956.45–959.85 MHz
1435–1525 MHz
6875.000–6900.000 MHz
7100.000–7125.000 MHz

(2) [Reserved]

(b) * * *

(2) Low power auxiliary stations may operate closer to co-channel TV broadcast stations than the distances specified in paragraph (b)(1) of this section provided that such operations either—

(i) Are coordinated with TV broadcast stations that could be affected by the low power auxiliary station operation, and coordination is completed prior to operation of the low power auxiliary station; or

(ii) Are limited to an indoor location that is not being used for over-the-air television viewing, and the following conditions are met with respect to the TV channel used: The TV signal falls below a threshold of −84 dBm over the entire channel; the signal is scanned across the full 6 megahertz channel where the wireless microphones would be operated; and to the extent that directional antennas are used, they are rotated to the place of maximum signal.

* * * * *

■ 9. Section 74.803 is amended by adding paragraphs (c) and (d) to read as follows:

§ 74.803 Frequency selection to avoid interference.

* * * * *

(c) In the 941.500–952.000 MHz, 952.850–956.250 MHz, 956.45–959.85

MHz, 6875.000–6900.000 MHz, and 7100.000–7125.000 MHz bands low power auxiliary station usage is secondary to other uses (*e.g.* Aural Broadcast Auxiliary, Television Broadcast Auxiliary, Cable Relay Service, Fixed Point to Point Microwave) and must not cause harmful interference. Applicants are responsible for selecting the frequency assignments that are least likely to result in mutual interference with other licensees in the same area. Applicants must consult local frequency coordination committees, where they exist, for information on frequencies available in the area. In selecting frequencies, consideration should be given to the relative location of receive points, normal transmission paths, and the nature of the contemplated operation.

(d) In the 1435–1525 MHz band, low power auxiliary stations (LPAS) are limited to operations at specific fixed locations that have been coordinated with the frequency coordinator for aeronautical mobile telemetry, the Aerospace and Flight Test Radio Coordinating Committee. LPAS devices must complete authentication and location verification before operation begins, employ software-based controls or similar functionality to prevent devices in the band from operating except in the specific channels, locations, and time periods that have been coordinated, and be capable of being tuned to any frequency in the band. Use is limited to situations where there is a need to deploy large numbers of LPAS for specified time periods, and use of other available spectrum resources is insufficient to meet the LPAS licensee's needs at the specific location. All LPAS devices operating in a particular area in the band may have access to no more than 30 megahertz of spectrum in the band at a given time.

■ 10. Section 74.831 is revised to read as follows:

§ 74.831 Scope of service and permissible transmissions.

The license for a low power auxiliary station authorizes the transmission of cues and orders to production personnel and participants in broadcast programs, motion pictures, and major events or productions and in the preparation therefor, the transmission of program material by means of a wireless microphone worn by a performer and other participants in a program, motion picture, or major event or production during rehearsal and during the actual broadcast, filming, recording, or event or production, or the transmission of comments, interviews, and reports from the scene of a remote broadcast. Low power auxiliary stations operating in the 941.5–952 MHz, 952.850–956.250 MHz, 956.45–959.85 MHz, 6875–6900 MHz, and 7100–7125 MHz bands may, in addition, transmit synchronizing signals and various control signals to portable or hand-carried TV cameras which employ low power radio signals in lieu of cable to deliver picture signals to the control point at the scene of a remote broadcast.

■ 11. Section 74.832 is amended by revising paragraphs (a)(6) and (d) to read as follows:

§ 74.832 Licensing requirements and procedures.

(a) * * *

(6) Licensees and conditional licensees of stations in the Broadband Radio Service as defined in section 27.1200 of this chapter, or entities that hold an executed lease agreement with a Broadband Radio Service or Educational Broadband Service licensee.

* * * * *

(d) Cable television operations, motion picture and television program producers, large venue owners or operators, and professional sound companies may be authorized to operate low power auxiliary stations in the bands allocated for TV broadcasting, the 941.500–952.000 MHz band, the 952.850–956.250 MHz band, the 956.45–959.85 MHz band, the 1435–1525 MHz band, the 6875–6900 MHz band, and the 7100–7125 MHz band. In the 6875–6900 MHz and 7100–7125 MHz bands, entities eligible to hold licenses for cable television relay service stations (see section 78.13 of this chapter) shall also be eligible to hold licenses for low power auxiliary stations.

* * * * *

■ 12. Section 74.851 is amended by revising the section heading and paragraph (i) and adding paragraphs (j), (k), and (l) to read as follows:

§ 74.851 Certification of equipment; prohibition on manufacture, import, sale, lease, offer for sale or lease, or shipment of devices that operate in the 700 MHz Band or the 600 MHz Band; labeling for 700 MHz or 600 MHz band equipment destined for non-U.S. markets; disclosures.

* * * * *

(i) Nine months after the release of the Commission's Channel Reassignment Public Notice issued pursuant to Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Report and Order, GN Docket No. 12–268, 29 FCC Rcd 6567 (2014), applications for certification shall no longer be accepted for low power auxiliary stations or wireless video assist devices that are capable of operating in the 600 MHz service band or the 600 MHz guard bands, or for low power auxiliary stations that are capable of operating in the 600 MHz duplex gap unless the operations are limited to the four megahertz segment from one to five megahertz above the lower edge of the 600 MHz duplex gap.

(j) Eighteen months after the release of the Commission's Channel Reassignment Public Notice issued pursuant to Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Report and Order, GN Docket No. 12–268, 29 FCC Rcd 6567 (2014), no person shall manufacture, import, sell, lease, offer for sale or lease, or ship low power auxiliary stations or wireless video assist devices that are capable of operating in the 600 MHz service band or the 600 MHz guard bands, or low power auxiliary stations that are capable of operating in the 600 MHz duplex gap unless the operations are limited to the four megahertz segment from one to five megahertz above the lower edge of the 600 MHz duplex gap. This prohibition does not apply to devices manufactured solely for export.

(k) Eighteen months after the release of the Commission's Channel Reassignment Public Notice issued pursuant to Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Report and Order, GN Docket No. 12–268, 29 FCC Rcd 6567 (2014), any person who manufactures, sells, leases, or offers for sale or lease low power auxiliary stations or wireless video assist devices that are destined for non-U.S. markets and that are capable of operating in the 600 MHz service band or the 600 MHz guard bands, or low power auxiliary stations that are capable of operating in the 600 MHz duplex gap unless such operations are limited to the four megahertz segment from one to five megahertz above the lower edge of the 600 MHz duplex gap, shall include labeling and make clear in all sales, marketing, and packaging materials, including online materials, relating to such devices that the devices cannot be operated in the United States.

(l) *Disclosure requirements for low power auxiliary station and wireless video assist devices capable of operating in the 600 MHz service band.* Any person who manufactures, sells, leases, or offers for sale or lease low power auxiliary stations or wireless video assist devices that are capable of operating in the 600 MHz service band three months following issuance of the

Channel Reassignment Public Notice, as defined in section 73.3700(a)(2) of this chapter, is subject to the following disclosure requirements:

(1) Such persons must display the consumer disclosure text, as specified by the Consumer and Governmental Affairs Bureau, at the point of sale or lease of each such low power auxiliary station or wireless video assist device. The text must be displayed in a clear, conspicuous, and readily legible manner. One way to fulfill the requirement in this section is to display the consumer disclosure text in a prominent manner on the product box by using a label (either printed onto the box or otherwise affixed to the box), a sticker, or other means. Another way to fulfill this requirement is to display the text immediately adjacent to each low power auxiliary station or wireless video assist device offered for sale or lease and clearly associated with the model to which it pertains.

(2) If such persons offer such low power auxiliary stations or wireless video assist device via direct mail, catalog, or electronic means, they shall prominently display the consumer disclosure text in close proximity to the images and descriptions of each such low power auxiliary station or wireless video assist device. The text should be in a size large enough to be clear, conspicuous, and readily legible, consistent with the dimensions of the advertisement or description.

(3) If such persons have Web sites pertaining to these low power auxiliary stations or wireless video assist devices, the consumer disclosure text must be displayed there in a clear, conspicuous, and readily legible manner (even in the event such persons do not sell low power auxiliary stations or wireless video assist devices directly to the public).

(4) The consumer disclosure text described in paragraph (l)(1) of this section is set forth as an appendix to this section.

* * * * *

■ 13. Section 74.861 is amended by revising paragraphs (d)(1) through (3), adding paragraph (d)(4), revising (e)(1)(i) and (ii), and adding paragraphs (e)(7) and (i) to read as follows:

§ 74.861 Technical requirements.

* * * * *

(d) * * *

(1) For all bands except the 1435–1525 MHz band, the maximum transmitter power which will be authorized is 1 watt. In the 1435–1525 MHz band, the maximum transmitter power which will be authorized is 250 milliwatts. Licensees may accept the manufacturer's power rating; however, it is the licensee's responsibility to observe specified power limits.

(2) If a low power auxiliary station employs amplitude modulation, modulation shall not exceed 100 percent on positive or negative peaks.

(3) For the 26.1–26.480 MHz, 161.625–161.775 MHz, 450–451 MHz, and 455–456 MHz bands, the occupied bandwidth shall not be greater than that necessary for satisfactory transmission and, in any event, an emission appearing on any discrete frequency outside the authorized band shall be attenuated, at least, $43+10 \log^{10}$ (mean output power, in watts) dB below the mean output power of the transmitting unit. The requirements of this paragraph shall also apply to the applications for certification of equipment for the 944–952 MHz band until nine months after release of the Commission's Channel Reassignment Public Notice, as defined in section 73.3700(a)(2) of this chapter.

(4)(i) For the 941.5–952 MHz, 952.850–956.250 MHz, 956.45–959.85 MHz, 1435–1525 MHz, 6875–6900 MHz and 7100–7125 MHz bands, analog emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in *Section 8.3.1.2 of the European Telecommunications Institute Standard ETSI EN 300 422–1 v1.4.2 (2011–08),.* Beyond one megahertz below and above the carrier frequency, emissions shall be attenuated 90 dB below the level of the unmodulated carrier.

(ii) For the 941.5–952 MHz, 952.850–956.250 MHz, 956.45–959.85 MHz, and 1435–1525 MHz bands, digital emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in *Section 8.3.2.2 (Figure 4) of the European Telecommunications Institute Standard ETSI EN 300 422–1 v1.4.2 (2011–08.* Beyond one megahertz below and above the carrier frequency, emissions shall be attenuated 90 dB below the level of the unmodulated carrier.

(iii) In the 6875–6900 MHz and 7100–7125 MHz bands, digital emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in *Section 8.3.2.2 (Figure 5) of the European Telecommunications Institute Standard ETSI EN 300 422–1 v1.4.2 (2011–08).* Beyond one megahertz below and above the carrier frequency, emissions shall be attenuated 90 dB below the level of the unmodulated carrier.

(iv) For the 944–952 MHz band, the requirements of this paragraph (d)(4) shall not apply to the applications for certification of equipment for that band until nine months after release of the Commission's Channel Reassignment Public Notice, as defined in section 73.3700(a)(2) of this chapter.

(e) * * *

(1) * * *

(i) 54–72, 76–88, and 174–216 MHz bands: 50 mW EIRP

(ii) 470–608 and 614–698: 250 mW conducted power

* * * * *

(7) Analog emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in *Section 8.3.1.2 of the European Telecommunications Institute Standard ETSI EN 300 422–1 v1.4.2 (2011–08).* Digital emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in *Section 8.3.2.2 (Figure 4) of the European Telecommunications Institute Standard ETSI EN 300 422–1 v1.4.2 (2011–08).* Beyond one megahertz below and above the carrier frequency, emissions shall be attenuated 90 dB below the level of the unmodulated carrier. The requirements of this paragraph (e)(7) shall not apply to applications for certification of equipment in these bands until nine months after release of the Commission's Channel Reassignment Public Notice, as defined in § 73.3700(a)(2) of this chapter.

* * * * *

(i) The materials listed in this section are incorporated by reference in this part. These incorporations by reference were approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. These materials are incorporated as they exist on the date of the approval, and notice of any change in these materials will be published in the **Federal Register**. All approved material is available for inspection at the Federal Communications Commission, 445 12th St. SW., Reference Information Center, Room CY–A257, Washington, DC 20554, (202) 418–0270 and is available from the sources below. It is also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call (202) 741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(1) European Telecommunications Standards Institute, 650 Route des

Lucioles, 06921 Sophia Antipolis Cedex, France. A copy of the standard is also available at *http://www.etsi.org/deliver/etsi_en/300400_300499/30042201/01.03.02_60/en_30042201v010302p.pdf.*

(i) ETSI EN 300 422–1 V1.4.2 (2011–08): ''*Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement,*'' Copyright 2011, IBR approved for section 15.236(g).

(ii) [Reserved]

(2) [Reserved].

PART 87—AVIATION SERVICES

■ 14. The authority citation for part 87 continues to read as follows:

Authority: 47 U.S.C. 154, 303 and 307(e), unless otherwise noted.

■ 15. Section 87.303 is amended by revising paragraph (d)(1) to read as follows:

§ 87.303 Frequencies

* * * * *

(d)(1) Frequencies in the band 1435–1525 MHz are also available for low power auxiliary station use on a secondary basis.

* * * * *

PART 90—PRIVATE LAND MOBILE RADIO SERVICES

■ 16. The authority citation for part 90 continues to read as follows:

Authority: Sections 4(i), 11, 303(g), 303(r), and 332(c)(7) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 161, 303(g), 303(r), and 332(c)(7), and Title VI of the Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. 112–96, 126 Stat. 156.

■ 17. Section 90.265 is amended by revising paragraph (b) introductory text and (b)(1) and (3) and adding paragraph (f) to read as follows:

§ 90.265 Assignment and use of frequencies in the bands allocated for Federal use.

* * * * *

(b) The following frequencies are available for wireless microphone operations to eligibles in this part, subject to the provisions of this paragraph:

Frequencies (MHz)

169.445
169.475
169.505
170.245
170.275
170.305
171.045
171.075
171.105
171.845
171.875
171.905

(1) On center frequencies 169.475 MHz, 170.275 MHz, 171.075 MHz, and 171.875 MHz, the emission bandwidth shall not exceed 200 kHz. On the other center frequencies listed in this paragraph (b), the emission bandwidth shall not exceed 54 kHz.

* * * * *

(3) For emissions with a bandwidth not exceeding 54 kHz, the frequency stability of wireless microphones shall limit the total emission to within ±32.5 kHz of the assigned frequency. Emissions with a bandwidth exceeding 54 kHz shall comply with the emission mask in Section 8.3 of ETSI EN 300 422–1 v1.4.2 (2011–08).

* * * * *

(f) The materials listed in this section are incorporated by reference in this part. These incorporations by reference were approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. These materials are incorporated as they exist on the date of the approval, and notice of any change in these materials will be published in the **Federal Register**. All approved material is available for inspection at the Federal Communications Commission, 445 12th St. SW., Reference Information Center, Room CY–A257, Washington, DC 20554, (202) 418–0270 and is available from the sources below. It is also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call (202) 741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(1) European Telecommunications Standards Institute, 650 Route des Lucioles, 06921 Sophia Antipolis Cedex, France. A copy of the standard is also available at *http://www.etsi.org/deliver/etsi_en/300400_300499/30042201/01.03.02_60/en_30042201v010302p.pdf.*

(i) ETSI EN 300 422–1 V1.4.2 (2011–08): ''*Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement,*'' Copyright 2011, IBR approved for section 15.236(g).

(ii) [Reserved]

(2) [Reserved]

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FEDERAL COMMUNICATIONS COMMISSION

47 CFR Parts 27 and 73

[GN Docket No. 12–268; ET Docket Nos. 13–26 and 14–14; FCC 15–141]

Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: This document resolves the remaining technical issues affecting the operation of new 600 MHz wireless licensees and broadcast television stations in areas where they operate on the same or adjacent channels in geographic proximity. Specifically, the Commission adopted the methodology and the regulatory framework for the protection of both wireless services and broadcasting in the post-auction environment that it proposed in October 2014. The Commission affirms its decision regarding the methodology to be used during the incentive auction to predict inter-service interference between broadcasting and wireless services. The Commission also affirmed its decision declining to adopt a cap on the aggregate amount of new interference a broadcast television station may receive from other television stations in the repacking process.

DATES: Effective December 17, 2015, except for the amendments to §§ 27.1310 and 73.3700(b)(1)(iv)(B), which contain new or modified information collection requirements subject to the Paperwork Reduction Act of 1995, Public Law 104–13, that are not effective until approved by the Office of Management and Budget (OMB). The Commission will publish a document in the **Federal Register** announcing the effective date once OMB approves.

ADDRESSES: Federal Communications Commission, 445 12th Street SW., Washington, DC 20554.

FOR FURTHER INFORMATION CONTACT: Aspasia Paroutsas, 202–418–7285, *Aspasia.Paroutsas@fcc.gov,* Office of Engineering and Technology.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's *Third Report and Order and First Reconsideration Order,* GN Docket No. 12–268; ET Docket Nos. 13–26 and No. 14–14, FCC 15–141, adopted October 21, 2015 and released October 26, 2015. The full text of this document is available for inspection and copying during normal business hours in the